Does the Public's Interest in the Science of Aging Affect How the Science is Done?

Live Debate
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AAAS, 1200 New York Avenue, Washington, D.C.
Thomas Johnson vs. Gene Cohen

FRIEDMAN: Good morning. My name is Jim Friedman. I'm the deputy director of the Alliance for Aging Research, and this is SAGE Crossroads—debates at the intersection of science and public policy.

The Alliance for Aging Research and AAAS sponsors these debates and have done so for the last year, and we welcome you to these debates. These debates are made available and funded by the Atlantic Philanthropies, the Archstone Foundation and the Retirement Research Foundation.

As always, the debates have been moderated by Mr. Morton Kondracke, who is the executive editor of *Roll Call*, the Congressional newspaper; and he is also the co-host of the "Beltway Boys" on FOX TV. Mort?

KONDRACKE: Thank you very much. Well, we are glad to be back, and this time we are going to discuss the question of does public opinion affect how aging research is done, and should it?

There is a lot of policymaking by members of Congress, by celebrities, by newspapers, by television stations, that make one kind of research or another "hot" and the question is whether that is a good way for science to be directed.

Our discussants today are Tom Johnson, who is a professor at the Institute for Behavioral Genetics at the University of Colorado in Boulder, and Gene Cohen, who is a professor of health care sciences and professor of psychiatry at George Washington University and is the first director of the Center on Aging, Health & Humanities at GW.

So we will begin with you, Mr. Cohen, and you state the case as you see it.

COHEN: Right. Well, I had the wonderful opportunity of heading programs on aging at NIH for twenty years, and watching this whole issue of the role of the public in relationship to the course of research on aging unfold. It's a very complex issue, a wonderfully complex issue.

Where perhaps public opinion has had the biggest effect on the course of research on aging has been around major disorders in the area of aging. For example, Alzheimer's disease has benefited enormously from public input through very effective advocacy groups.

At the same time, there are so many other areas in need of investigation, so this creates a creative tension and competition.

And at a whole other level, there is the issue of how do you balance a research program in terms of focus on clinical issues, disorders, problems, and to what extent do you focus on basic research, which is where you come up with whole new answers that affect the whole future course of aging.

Issues around disorders, popular issues of the day, these grab attention, and these often get a larger play in the press and often a more audible voice in influencing policy. So basic research often has to compete very hard with that to stay with the frontiers of the field.

At the same time, wherever you have growth in a certain area, any area, it creates a momentum for the field as a whole. So that's essentially what's been happening in the field of aging, which is largely just the fourth quarter of the twentieth century and early twenty-first century phenomenon.

So it's—you have many different voices, many different influences, and it's a bit of an interesting choreography as to how they play out.

KONDRACKE: OK. Tom?

JOHNSON: Yeah. You know, in a real sense this isn't a debate, because I think Gene and I are seeing the same thing, but from opposite directions.

My role is a basic scientist where I deal primarily with fundamental aspects of aging. In particular, our focus has been on trying to understand what the aging processes are all about at the molecular level.

And there, I think we've actually lost track over the last twenty years of some of the great progress that has—is being made in the laboratory sciences. Instead, we have been emphasizing, as Gene just pointed out, a sort of an advocacy-based research objective, wherein patient groups and people whose primary objectives and allegiances are to one or another diseases, primarily because they've seen family members or other friends who have been afflicted with those diseases. These advocacy groups are being heard at a sort of a disadvantage to the basic research.

A recent estimate that was made by Rich Miller suggests that about 2/100ths of one percent of all of the money spent by the National Institutes of Health is actually spent on fundamental aging research, even though the bang for the buck, as outlined in last

February's *Science—Science* of 2003—had a special issue on aging where Bob Binstock and others pointed out that there is a tremendous return if we can actually understand what's going on in the basic aging processes, because we can actually postpone and even alleviate many of these diseases that are being talked about by individual advocacy groups.

So basically, the perspective is that we have advocacy groups that are really driving Congress, and also the National Institutes of Health, for programmed diseases for scientific programs focused on different diseases, while the fundamental processes of aging, that, surprisingly enough, seem to be able to be intervened in directly, have largely been without any advocacy.

And, you know, I don't think aging is unique in this aspect. I think it's common in the basic sciences throughout the National Institutes of Health and, actually, other places as well.

KONDRACKE: Well, let me confess up front that I'm not entirely neutral in this whole area. I'm on the board of the Michael J. Fox Foundation and also the Parkinson's Action Network, and I have—so I sort of have an ax to grind in all this. But I will be, as they say, fair and balanced in discussing this subject.

But you know, one—as a disease activist—on behalf of Parkinson's specifically, we and other disease advocacy groups bang our heads against the wall at NIH trying to get increased funding for one disease or another, and it looks to us as though NIH does—just does what it wants to do.

In other words, Harold Varmus, particularly, when he was the director at NIH, who was a basic scientist, was interested in molecules and genes, and stuff like that, and it didn't make any difference how much screaming and yelling the disease groups did, you know, the grants went out to who the grants went out to, and most of them were the basic scientists. Now, is your experience different?

COHEN: Actually, it is. When I started at NIH it was right at the time that NIA was beginning. And it had a budget of less than $50 million. When I left twenty years later, its budget had been around $500 million. So it was a ten-fold increase, small compared to many other institutes.

But a lot of that growth, particularly in the area of NIA, actually well over half of it was because of advocacy in the area of Alzheimer's disease. And so what it did is it made a tremendous contribution to that area, but it also brought aging forward as a serious field, because just the image of a $50 million institute versus a $500 million institute—and I feel that that momentum benefits many other areas of concern.

But it was really the effectiveness of advocacy groups, and particularly in Alzheimer's disease, but many others as well, that did it.

KONDRACKE: But did the Alzheimer's—as I understand it, Alzheimer's was once lodged in the Neurological Institute, and then it, as I—by legend, anyway—the Alzheimer's advocacy community sort of took over the Aging Institute? But I—correct me if the history is wrong. But you—as you say, your budget went up ten-fold. Now, that helped aging research as a whole, basic aging research, did it not, in the process?

COHEN: All areas benefited from that. They all went up significantly. Clinical research more than basic research in the process. But even in the area of Alzheimer's disease, it led to a fair amount of research at the basic level.

KONDRACKE: So what is the complaint? Why should anybody be disturbed by this?

JOHNSON: I mean it—you know, in a real sense, I think you are absolutely right. We shouldn't be disturbed by the fact that the National Institute on Aging, in particular, has seen a great growth.

You know, Florence Mahoney, who was sort of a trumpet behind the founding of the National Institute on Aging in 1974, was herself, you know, a very important activist, proposing that the National Institute on Aging be founded to begin with. And in a real sense, I think, all ships rise as does the tide.

Nevertheless, I think it certainly is true that the drive to understand the basic processes of aging has been something that up until the last two decades has been almost entirely ignored.

As a matter of fact, there was great controversy within the National Institute on Aging on whether or not we actually wanted to even have any aspect of that institute be pro-longevity, with a concept that we actually can extend life span. For a long time, it's been adding life to the years, not years to the life.

I think the fundamental research that has come out in the last couple of decades, and especially in the last ten years, has made us recognize that there actually are fundamental cellular processes that not only result in prolonging life, which is the area that I've really focused on, but these same fundamental processes that are leading to a longer life are prolonging healthy life.

And interestingly enough, in the model system that we work on, where we create Parkinson's disease using some chemical mimics of that disease, we find that the very same processes that extend life span help to prevent Parkinson's disease.

So we are actually very optimistic that a number of diseases, but particularly both Alzheimer's and Parkinson's, can be perhaps not alleviated, but greatly postponed and the effects of these diseases put off maybe two or three decades, if we actually understand the basic processes that are underlying aging itself.

KONDRACKE: So, when grant-makers—when grant-seekers, I should say—are looking for money for NIH, if you are doing a basic research project in the processes of aging don't you—aren't you inclined to mention Alzheimer's or Parkinson's in the grant application in order to get it funded?

JOHNSON: Interestingly enough, I've spent the last two days on a study section, a new study section that has just been developed to allow us to actually look at a fairly large spectrum of all of the grants that are being funded by the NIA or at least would be funded by the NIA, if there were sufficient funds.

And it certainly is true that a significant part of the grant application is showing the medical relevancy of the proposed research.

There are so many targets, for instance, that people are examining, that I think Alzheimer's—certainly Alzheimer's, in my study section, which is a very basic one—is mentioned in probably only fifteen or twenty percent of the grants. And Parkinson's similarly.

Most of the grants that we've been reviewing, for instance, have to do with either fundamental aging processes, about fifteen percent, or things that are non-neurological. Heart disease, stroke, cancer, in particular, are the things that we have been looking at.

KONDRACKE: But your argument is that if you just put an application in saying, "I want to investigate this aspect of the fundamental aging process," you are less likely to get funded than you would be if you mentioned a specific disease?

JOHNSON: I think that there has been a prejudice in that direction. It's actually a fairly revolutionary insight that's occurred, as I mentioned, over the last couple of decades, that you can actually do something with the fundamental processes of aging. And we know that because we can extend life span now in model systems—the record actually is 7.7 fold extension.

KONDRACKE: That's fruit flies—or—

JOHNSON: This is actually in nematodes—

KONDRACKE: Nematodes —right.

JOHNSON: Right. The nematodes tends to be—

KONDRACKE: Which is a worm, right?

JOHNSON: That's right. This is the little round worm that's a tiny little speck, about one millimeter long.

But we are finding that the same fundamental processes that work in this animal are found in mammals and in humans. Over the last three years, a number of researchers have shown that the mouse, for instance, the life span and disease resistance in the mouse can be manipulated by working with the same fundamental processes that have been evolutionarily conserved and are found in the mouse and are found in humans.

KONDRACKE: We've had a number of programs in this series about the subject of whether aging is really a disease or whether it is curable, or whether there are biomarkers for it. And so on. And the question remains—I take it that you are pretty convinced that aging is a curable process—someday.

JOHNSON: I think it's postponable. I actually am very conservative within the scientific network, as not wanting to go much beyond what the data actually say. And right now we know that we can slow aging dramatically, and we can postpone some of the negative aspects of aging. But we can't cure it. We can't stop it and we can't reverse it.

I think it's an interesting debate that I and several others—

KONDRACKE: But do we know what it is?

JOHNSON: We don't, and I think that's the root, really, of the problem—that we don't really know what it is. Actually, I don't even think there's an "it" there. Aging is a mix—a mixture of different processes that varies with the organ system and the species.

Even though we've been lucky in finding some things from these model systems that have great medical relevance, I don't think everything is going to be medically relevant.

So I think, you know, we really do have to be very informed on these topics.

KONDRACKE: So what proportion of the NIA budget actually goes to research into the processes of aging, as opposed to specific diseases?

COHEN: Actually, that's a good question to ask because you have to go back one point, and I think it gets to the question of whether there is a bias in the reviewing of the proposals.

I don't feel there is a bias at all in the reviewing of the proposals.

First of all, when the allocations come to the institutes, they are often earmarked. So if you have, let's say, sixty percent of your funds that are earmarked for Alzheimer's disease—

KONDRACKE: By whom?

COHEN: Congress. Congress. See, so—

KONDRACKE: Now wait. Let's stop there. By—according to John Porter, who used to be the chairman of the Labor-HHS subcommittee, and Arlen Specter, who is the senator who is comparable, they don't earmark. What—there are earmarks for Alzheimer's?

COHEN: Well, well, I know—I had many calls as heading a program with staffers who said that the intent for budget disbursement was this in this area, or this in another area, and if the institute's behavior didn't reflect that, we wouldn't do as well in the next funding cycle.

So whereas in some cases it may not have been earmarked on paper, in other cases it clearly was. You read the legislative intent, it's spelled out. In other areas, it's conveyed strongly by Congressional conversation or staff conversation. So there's a certain reality that has to take place there in terms of doing the best by the areas that brought in the funds, but also to protect other areas.

Also, it's not just a matter of what goes into disorders versus what goes into basic research. There are other areas, like behavioral research and social research, and when you look at what's happened to life expectancy, for example, during the twentieth century, in 1900 life expectancy was under fifty years in America. By 2000 it was over seventy-five years. That was a fifty percent increase without any change in the human genome.

So there's a lot more that could still be done in terms of health promotion, prevention, behavioral efforts. All of those are greatly underfunded, as well. For—

KONDRACKE: Is that NIH's business, do you think?

COHEN: Yes. Oh, yes. See, I feel personally that the field of aging is now at the second major conceptual turning point in the history of gerontology.

The first major turning point occurred in the mid-1970s. In the mid-1970s, you still had all of these stereotypes about negative—severe negative changes with aging being your destiny.

Alzheimer's disease, as a term, was largely not used. It was senility, which implied your fate. It was an inevitable destiny with aging.

In the mid-1970s hypotheses began to emerge. So, for example, the first hypothesis as to what caused Alzheimer's disease—it was a neurotransmitter deficit that was discovered. And so suddenly people started to look at negative changes as not representing aging, but problems that were associated with aging.

And once you see a negative change as a problem rather than a destiny, it fundamentally redefines, from a scientific standpoint, your sense of opportunity to do something about it, and from a social stand point your responsibility.

Now, that was a revolutionary change in thinking, and that launched the modern field of geriatrics and was a tremendous impetus to the growth. Not even on the radar screen at that time was the sense of potential in aging. Potential? What are you talking about? The negative concept was so dominant. But come the turn of the twenty-first century, there was the start of what I feel is the second revolution in thinking, and that was the sense of possibility, potential. And that drives a whole other thrust in the field of aging. And certainly the boomers are weighing in very strong with that.

KONDRACKE: The thrust being…?

COHEN: The thrust to look at what research can tell us about how you can better promote health, tapped into aspects of yourself that you hadn't tapped into.

Neuroscience research, more basic studies, that relate to this find that when you challenge the mind, when someone is in a more enriched environment, brain cells actually sprout new projections, called dendrites. They are like branches from a tree. And so you actually can enhance the vitality of your brain through challenge and a more stimulating environment.

Those are basically—

KONDRACKE: And there are no—are there studies at NIH to further this concept? Or not?

COHEN: They are only just starting, but they pale compared to the focus on disorders, where there is no denying that there is so much more we need to do. You know, when you look at the budget for cancer research, over $2 billion, it's—that's for a single disorder, as opposed to all of the areas—

KONDRACKE: Well, it's for many different disorders.

COHEN: Yes. But it's within cancer. And it's not a question of which is more important, but what it illustrates when you have a high level of funding in one area is that when society understands a problem and its importance, its values adjust in terms of what it's willing to spend.

So that's been happening in the area of aging, but there are more and more areas that we recognize as providing exciting and important research opportunities. Many of these are types of approaches that help extend life expectancy over fifty percent during that time.

What Tom is talking about is the difference between life expectancy and life span. Life span is the upper limit of the species. Life expectancy is the average longevity.

KONDRACKE: Let me invite our viewing audience to submit questions. We have some that have already arrived, but we welcome others and we will get to them shortly.

Let me just ask you one fundamental political question. You are both scientists and you are both working in labs.

The Bush administration has put in a budget for NIH—a total of a 2.7 percent increase down from what was a fourteen-fifteen percent increase over the past five years, during which the overall budget of NIH doubled. Now, what is going to be the consequence research—community-wide—to this dramatic slowdown in the rate of increase at NIH?

COHEN: It comes at a very bad time. Science is at a comparable point of historic change as when the x-ray and ether were introduced in medicine. The new tools in science and the new fundamental understanding are revolutionary in its capacity.

And to choose such a time to slow down with regard to what could come out of the science is puzzling to me. I guess that's the best euphemism I can come up with.

At the same time, with all of the concerns about economics, the economic ramifications, the fruits of all this research, apart from the benefit for people, are enormous. And so it doesn't—

KONDRACKE: What are they?

COHEN: All the products of this that could launch new industries, health-related industries that could improve function, well being for the people—apart from the human benefit—but the economic benefit is enormous. So I find it doubling puzzling.

KONDRACKE: So are labs going to have to shut down and scientists going to be fired? Or what—how bad is it going to be for the infrastructure?

COHEN: Well, part of it is like taking the small fish out of the ocean. It's going to have a significant impact on the generation of future scientists. They have a much harder time competing. They are not seasoned scientists. They are not going to fare well in this. And so you will do—your seasoned scientists will do OK for a while, but then suddenly you are robbing the future. It's a very serious and, I think, a scientifically short-sighted move.

JOHNSON: Yeah. I just want to second that, because having just come from a meeting where we had to rank a bunch of basic science grants, we actually reviewed seventy grants, and it's very disappointing to know that without significant changes in the budget, that only three of those—maybe four of those—will get funded.

I mean, that's just—it hardly seems worth putting the effort into it when there are twenty or so really good grants in there that just are not going to get any funding at all.
And you know, this comes after a conversation with someone who actually is, you know, still active in the NIA, and the NIA is very concerned about it. They are trying to make some fiscal adjustments internally to allow more funding. But it's—it really is disastrous. There's almost not a single junior person in our program that, I think, is going to manage to get funded because of this—

KONDRACKE: So are they going to have to leave? Well, how are they going to—

JOHNSON: So—you know, most of these people are academic scientists. I assume that they will continue with their research at reduced levels or—and certainly teaching and other academic duties.

I don't think that we are going to have a general falling out of the field yet. But I think if we see 2.7 percent increases for another two or three years that we are going to see that effect. That great momentum that was generated in the doubling of the NIH budget really needs to be pushed now, and we need to start utilizing that fundamental research to get these concepts into practice. The bench top-to-bedside concept, I think, has really started working. And this, you know, very stingy increase, I think, really has great potential to just bring that to a real dramatic halt.

KONDRACKE: Now, I mean, fundamentally, science, medical science in the United States—its biggest source of revenue, I guess next to pharmaceutical companies, is the federal government, right? I mean, so—and inevitably, policymakers are going to decide how the money gets spent, you know.

So what is their role? What ought their role be? They can't—they can't—they have to make decisions. They have a limited budget. So what do you think policymakers, you know, members of Congress, the director of OMB, the president, and so on. How should he go about—how should they go about making their decisions?

COHEN: Well, they are clearly hard decisions, but there is no doubt that a lot of these are influenced politically. And so there you have to bring in other players who play in that domain, and that's, of course, where the role traditionally of different advocacy groups are.

And the point is, in many areas you don't know what the impact is going to be for investment. But in this area, my gosh, when you look at the twentieth century, over a fifty percent increase in life expectancy, and a lot of that was in the second half of the twentieth century, where the real gains in quality of life were occurring.

This is not the time, you know, to cut the engines in terms of what's happening. This extra—I mean, how many fields could point to progress of this nature from just a humanitarian standpoint?

And also, if you look at what's happening on the other side of the demographics, fortunately, health—older people are becoming healthier than ever before. But because of the numbers, you have more who are very sick than ever before. The percentage is going down, but the absolute numbers are huge because we have had a ten-fold increase in those over sixty-five in the past hundred years, a twenty-fold increase over seventy-five, a thirty-fold increase over eighty-five. These are staggering numbers.

And whereas we have a society that doesn't have a long-term care insurance, we don't have national health insurance, you can't both not provide the necessary care and at the same time not provide the research that will reduce the risk factors driving the need for that care. So if you are not going to spend the mega billions right now for long-term care, you can spend the mega millions that can alter the risk factors that drive the need.

KONDRACKE: So, I mean, you basically have no problem with the idea that politicians are going to decide the future of research? I mean, you think it is inevitable and—

COHEN: Oh. It's just how the budget falls. But the politicians want to be re-elected. And so they clearly are influenced by public debate and what have you.

I remember when Senator Harkin from Iowa was up for re-election. Iowa at that time, I think, had one of the highest percentages of old people in the country. It wasn't that they were growing. It was that the young ones were moving out of the state. So it was very important for him to appeal to that vote, and that year there was a significant increase in the research budget on aging. So what they were making is a statement is that "We are struggling with issues of long-term care, but while struggling with that, we are going to focus on research that is going to address the risk factors creating the need for long-term care."

And that's both applied and basic research. And so—but that was the public influencing politics.

KONDRACKE: Well, it occurs to me that if you have an aging—an increasingly aging—population that the political oomph behind aging research would increase—for example, I mean, where is the AARP on the issue of aging research? Is it pushing aging research? Or it has—it obviously has a lot of power.

JOHNSON: Right.

KONDRACKE: Do you feel that it is your ally?

JOHNSON: You know, I think the AARP has yet to really throw its weight behind fundamental aging research in a significant fashion. I mean, I think that probably Gene can speak to this better than I.

But I think that's the kind of advocacy that we really do need. We need to—I mean, you know, there's another threat, a fundamental threat to anti-aging research as I've been talking about it. And that is the conservative bent of the President's Council on Bioethics that has actually recently brought forth the statement saying that anti-aging research is unethical. And that—

KONDRACKE: Has it really gone that far?

JOHNSON: Well, I think it really has gone that far. You know, I think there's a significant push by the current administration to—at least in the direction of stopping support on this.

And you know that's—it's certainly not universally held. The Catholic Church, for instance, has come out dramatically in favor. Pope Paul issued an edict about three years ago saying that fundamental aging research is an extension of the God-given abilities of human beings to understand their fundamental nature and manipulate it.

So we need to not be locked into a conservative agenda that sort of sees anti-aging research as blocking the sort of God-given need to die, or you know, some such pseudo-ethical statements that I think are really, you know, on the edge of being made, if not actively proclaimed.

KONDRACKE: And has that report—this is a published report? Because I have actually talked to members of the President's Council on Bioethics who say that, "Well, that's not quite what we said."

But has it had an impact, do you think? And what exactly have they said?

JOHNSON: Yeah, I mean, you know, I—I actually cannot quote in detail what the council has said on anti-aging research. I think that it has had very little impact as of yet.

But my concern is that if the administration sees that as a way to get out from under the burden of supporting this fundamental research that it would be a very easy out to go that route.

We certainly have had complete blocks on stem cell research, which are clearly—have fundamental implications in Parkinson's disease, and many other very important aspects of anti-aging research, as a result of ethical concerns.

I am not saying that the ethical concerns are wrong. I think that the ethical concerns need to be universal concerns and not these sectarian concerns that are really not universally accepted and are in some sense, I think, being put forward primarily on a political agenda, rather than on a real ethical agenda.

KONDRACKE: Well, let's not get off into stem cells. We actually—we had a quite vigorous debate about stem cells a while back.

What is your view of the role of celebrities in all this? I mean, do you think that they—that celebrities are, you know, unfairly shifting the direction of research?

COHEN: Well, I remember vividly from so many hearings with Congress the choreography. The choreography had three parts to it.

The first part was the celebrities, and that brought the Congressmen into the room. No celebrities—

KONDRACKE: And the TV cameras.

COHEN: Right!—no Congressmen! And so you have the celebrities, twenty people show up. No celebrities, maybe one person, in and out of the room.

The second part after the Congressmen are there and they are awake—

KONDRACKE: They get their picture taken, right?

COHEN: Right. The families come in.

KONDRACKE: Right.

COHEN: And then you hear the very real tragedies that people are having. And then the third part of the choreography is that the scientists come in and they tell you what is possible.

That was a very, very effective format.

Celebrities are a reality. I mean, you don't want them dictating the policy but if integrated well into a very thoughtful and creative choreography they can make a difference. The problem is that if you have isolated views influencing the course of events—that's a problem. But that arrangement typically worked very well.

KONDRACKE: Maybe aging research needs a celebrity advocate or some celebrity advocates. Is that an option?

JOHNSON: Yeah, one of the real problems, if you will, about aging is that it is something that we all participate in. There's not a situation in which there are isolated individuals that are aging while the rest of us are not.

And there are advocacy groups, for instance, of the so-called rapid aging diseases, that—the progeria diseases—and as a direct result of some of that advocacy, we've actually made tremendous headways into understanding the details of, for instance, of the early onset progeria diseases. And, even potentially made some dramatic interventions into that.

So celebrity, I think, is useful. I think, though, that the real use is—the real celebrity that we need to get out there—is these huge advocacy groups like the AARP. And you know, I think it takes a fundamental recognition that we actually can do something about it—that our destiny is not absolutely invariant, that there are fundamental ways that we can intervene and alter the overall time course.

This has been controversial. I was in this building fifteen years ago talking about aging as a disease, and no one would even let me make that statement because of the sort of concept that it's not a disease. Everybody has it. Diseases are things that are not uniformly distributed among everybody in the population.

And now it's sort of widely looked at as potentially a disease that everyone has. And that gives us, as Gene was pointing out, that gives us the ability to start thinking differently about it and start thinking about ways to do something about "it"—"it" being the aging processes.

KONDRACKE: Well, is there something that the "research industry" should be doing to bring the problem of aging research front and center to both Congress and the public, so that it has more priority than it does? And if so, what?

JOHNSON: This is a very interesting subject, because—I mean, just again speaking very personally now, one of the concerns that I've had over the years is that I not lose my ability to speak to the hard-core scientists. Because of the long history of aging research as being filled with charlatans and scoundrels, I—and I think a number of my colleagues—have been very hesitant to really push dramatically this concept that we can actually do something to halt the, you know, continual progression of aging.

So I think there's been sort of less scientific advocacy than might otherwise be. But one of the places where we can really see that turning around dramatically is in the number of companies that now have it—private companies—you know, almost entirely funded by the venture capital community. That, within actually the last three or four years, now have as part of their avowed mission a very serious anti-aging component.

The New York Times ran an interesting four-page article on this about four months ago, and I think they list twenty-eight companies, and that was by no means the total series. So there, you know, clearly private investment is beginning to see that there is a significant future—and significant return on their investment in this area.

COHEN: There is a debate issue in here, and that is to continue focusing on sort of the difference between life expectancy and life span—life span being the upper limit—and to what extent research should focus on pushing that, or to what extent research should focus on advancing life expectancy and the quality of those years. To be sure, as Tom was pointing out, a lot of fundamental research relates to both.

One of the points that I was making, if you look at what happened in the twentieth century, that is still when you are not thinking advancing life span, but what you can do to life expectancy in the quality of those years.

I have a retirement study, a twenty-first century retirement study, that began in 2000. I have one hundred people in this study. There is no upper age limit. You have to be sixty to be in the study. And it's men and women from sixty into their nineties. I do all the interviews.

KONDRACKE: NIH-funded, or not?

COHEN: It—no. It's funded by, actually, a philanthropic group. I have had now over 1,000 hours of interviews and not one person in the hundred has expressed their primary goal to have an extension of the years.

There would be nothing wrong with that if they were quality years. But where their emphasis is is in the quality of years that they have. So they are not starting off in terms of saying, "This is what I want, to live to 175." Their biggest concern is that the years that they have are good years. They would like more good years, but it's a different focus than—

KONDRACKE: Well, that suggests that they want to avoid the diseases of aging.

COHEN: Diseases associated with aging.

KONDRACKE: OK.

COHEN: Yes.

KONDRACKE: Which is, you know, Alzheimer's and Parkinson's and stroke and heart disease and all of that, which is where the money's going, right?

So what the older people want is quality of life and avoidance of disease; then aren't the priorities that we have now that are disease-oriented the priorities that those people want?

COHEN: But that—that quality of life, and this was the other point I made about the conceptual turning point, isn't just a factor of disease treatment and prevention. They are promoting interventions that you—could be done.

So if you are doing an exercise that strengthens your muscle, that is not treating or preventing a disease. It's maximizing vitality.

If you are challenging your mind and preserving, better preserving the cells that are there, you are not preventing Alzheimer's disease in that sense. You are better maximizing and promoting what you have. It's a whole different focus in addition to the better treatment and prevention of diseases.

It really is separate from it. They intersect, but they are fundamentally separate, and that's sort of a whole other area that's developing in aging, but has still—pales in terms of the support compared to a number of these other areas. Because people for so long felt that you couldn't do anything to promote better health.

KONDRACKE: There has been—I've heard the complaint, and I think Tom Harkin, Senator Harkin, is one of the people who makes it, that the National Institutes of Health is not the National Institutes of Health. It is the National Institutes of Winning Nobel Prizes.

And you know, so the question is whether there needs to be an actual focus out there on, you know, healthy living or a change of focus, and if so, how would you bring it about?

JOHNSON: Um-hmm. I mean, you know, I think that there is certainly a need to bring the fundamental research to the bedside, and I think that this is something that I have very little first-hand observation with. You know, I am really a bench top scientist that almost—actually never sees patients. I see the healthy young undergraduates that are around my campus.

But I think that that really is an important fundamental aspect of the mission of the National Institutes of Health. I wanted to go back, though, to expand just slightly on something that Gene was just saying, because, you know, I think it cannot be emphasized too much that the two processes—the processes of having health and old age, and the processes of actually extending life span—seem to be opposite sides of the same coin.

When we promote increased health, we obviously get some increase in longevity. But most importantly, and actually very surprisingly, when we use these dramatic interventions that dramatically extend life span, we see a great increase in the resistance to diseases. Cancer, heart diseases, almost everything that we look at is put off and, in some cases, almost entirely prevented as a result of these fundamental interventions. So I think if we—

KONDRACKE: Such as—? What do you mean by that?

JOHNSON: Well, such as a genetic trek that alters a particular wound that recognizes fundamental regulatory processes in the mouse. The mice that have been—

KONDRACKE: Not—it's not translated into humans yet?

JOHNSON: There is beginning to be some translational research in terms of epidemiology, where we—I am participating in a study, for instance, in San Francisco, where we are trying to do translational research. But that's—that's exactly where this research really has to go.

KONDRACKE: That does lead to the question—I was talking to the commissioner of the Food and Drug Administration, Mark McClellan, just the other day, who said that in spite of all of the money that has been put into NIH and all the—the hundred billion dollars I guess, a year, that pharmaceutical companies spend on their own research, that the number of patents actually issued in the year 2002 was the lowest it's been in I don't know how long.

Now, something is clogging up the works here. I mean, you've got presumably great discoveries coming out of basic research, and it's going into the pharmaceutical process, but for some reason it gets stuck on a shelf and never actually translated into a medicine that is actually going to cure somebody, at least according to the patent process. What is going on?

COHEN: I don't know if there's a backlog in the Patent Office, or—

KONDRACKE: Oh, I don't think it's a backlog. I mean, you would think that they would be applying for patents if they had the stuff to do it, because they would like to get the—presumably get the ownership of the molecule or whatever it was.

COHEN: I'm surprised to hear that, because each year when I get my *PDR* it gets bigger and bigger and smaller and smaller print! So, it's not a static industry. I don' t know what to say about that. It doesn't correspond to what I see in terms of fundamental new developments and translations of that into new products and interventions.

But just the *PDR* itself! It is becoming like the *Oxford Dictionary*.

KONDRACKE: Maybe changes in the color of the boxes.

(Laughter)

KONDRACKE: OK. Do you think that the fact that the population is aging, you know, the baby boom generation is reaching retirement age, is going to change the emphasis toward anti-aging research? Do you—or is there a potential to do that and if so, how would you harness it?

JOHNSON: I think there is great potential there. One of the things that I do when I teach undergraduate courses in aging is I ask this room full of health students how many think that we should really conduct vigorous anti-aging research. And there is probably not a single hand that goes up. But if I ask the same question to a group of people that are in their forties and fifties, most of the hands will go up. So there's certainly an increased interest with anti-aging medicine and anti-aging treatments as people get older.

You know, I would certainly like to be running around on the tennis courts for another fifty years, chasing down balls. At my current rate of knee loss, I don't think that that is going to be likely unless I can come up with some intervention to slow that down. And I think a lot of us feel that way.

You know, we don't want to spend our years in a wheelchair. We want to spend them vigorously. I think that we have to get the recognition out there to the population that really has the political power that there is something that can be done, and that dramatic increases—I mean you know, we need to keep going with this fifteen percent a year increases in NIA budget for another ten years. We should have a budget. Well, there's lots of basic research that cannot be funded just because we don't have the funds to do it.

COHEN: Two points very germane to this, and what Tom has said.

Many people talk about the boomers in terms of being used to getting their way, their numbers, never being beaten down by a major social event like the Great Depression. But a lot of my research is developmental—human growth and development. And to me, one of the most important findings in studying the boomers is that they are the first group in history that's grown up with many positive models of aging. I mean, many of their parents are CEOs, Pulitzer Prize winners, teaching college, heading blue-collar or white-collar agencies. They see what can be done. So they are the first group in history that in large numbers is not denying aging. So their expectations of what can and should be is historically completely different than any before. And that is going to profoundly influence, I feel, public opinion and policies toward aging.

Now, as far as the forty-year-olds, part of this developmental research, it's interesting, most older people don't have a fear of aging. It's unusual to find old people with a dread of aging. They are concerned about loved ones dying, what have you.

We are—dread of death is the greatest, for those of us turning forty. And for the first time people are thinking about how much time is left in life, as opposed to what's gone by. So that is the age group that is most concerned about mortality and life extension and what have you. It's a developmental phenomenon that comes into play.

KONDRACKE: So, so—how would you—it seems to me, 101 here, that on the AIDS model, the AIDS community vastly increased the amount of money that was being spent on AIDS research. The breast cancer people, you know, followed in line and so on and so forth. And we've had, you know, one campaign after another. It would seem to me that the organizations of the aging would want to get involved in this, and I—it seems to me that somebody ought to call the AARP and say, you know, "Instead of just, you know, making pharmaceuticals cheaper, why aren't we leaning on Congress to try to delay the aging process and make people healthier?"

I mean, has that been done? Where is the AARP in all of this, as the largest spokes-organization for the aged?

COHEN: Yeah. These are probably the reasons that they are fundamentally reexamining their raison d'etre of what they are. First of all, they changed their name to just AARP.

KONDRACKE: AARP, yeah.

COHEN: And, and—now this tremendous focus on fifty-year-olds. And part of it is despite the demographics, they weren't growing in membership. And part of it is a lot of people felt that they weren't taking this sort of big picture focus and were looking at more immediate and important, but narrower, issues.

So I think from many points of influence, they are going to have to—and must be fundamentally re-examining where and how they are going to weigh in on these issues. But yeah, they've been a sleeping giant.

JOHNSON: Yeah. And you know, Morton, it seems to me that it would be good to get somebody from AARP here and ask them that question. Because, you know, for years that's—it's sort of occurred to me as being a member of several scientific organizations promoting aging research that we don't have the political advocacy that we should have.

KONDRACKE: OK. I promise that I will call Bill Novelli myself.

(Laughter)

KONDRACKE: The head of the AARP.

Thank you all so much for joining us. I really appreciate it, Dr. Cohen and Tom Johnson, and we'll be with you next month.

Thank you for watching.

End.