

Welcome Lecture - 2000 Conference on Science Integration Todd Duncan

(first slide) The aim of this meeting is to facilitate a discussion of what we call *science integration*, which is essentially the process by which insights from science are incorporated or assimilated into people's worldviews, into the ways they see themselves and their roles as part of the universe.

In particular, at this first meeting, we'll be actively engaged in this integration process for some specific areas of physical science that our speakers will focus on. The points they raise will set up a framework for discussion about what the broad insights we gain from these sciences might tell us that could influence the core beliefs we each hold, beliefs that structure our decisions and our way of interacting with the world in daily life. In future years of this meeting, we'll expand to have similar discussions of other areas of science.

I think there is momentum and clarity of direction beginning to build for this sort of perspective on science, so I expect that the kinds of ideas we'll be talking about this weekend will have a significant positive impact on the evolving interaction between science and society. It's a very exciting time, and I'm looking forward to the discussions in the next 2 days as an enlightening and energizing process of continuing to build a foundation and community for really exploring this worldview-building aspect of science. I also expect the weekend will help us all see more clearly the possibilities and power this aspect of science holds as it becomes more visible and widely recognized, both in the scientific community and in society in general. I encourage you to see yourselves as fully part of a movement just getting underway, and to realize that your discussion and input will truly help shape its direction. And this conference is just a beginning point - there are many ways to continue the discussions we'll start here - contacts I hope you'll make, email discussion group, research journal, local workshops, etc.)

I'll try to set the stage in the next 25 minutes by offering a sketch of the framework within which I see physical science contributing to our individual searches for meaning, purpose, significance, or whatever you like to call it. I hope this will set the tone for the kinds of discussions we'll have, the kinds of information and insights we may want to extract from the specific subject talks tonight and tomorrow.

To begin, independently of any talk about science, everyone is probably familiar with trying to make their lives meaningful in some way. We want to try to do things that are important, that really matter. And we all have a set of beliefs (often unconsciously held) about how we relate to the world, about what's really important, that frames what we do and lies behind our interactions with things as we go through daily life.

What's less familiar is a consciously articulated idea that *science* has much to do

with this set of beliefs we hold. Part of the reason this link to science is not so obvious is that most of the time, our awareness includes only a tiny fraction of all that is going on in the universe. We are naturally and probably necessarily focused on the pressing concerns of our personal interactions with immediate surroundings. It's hard enough just to stay aware of other *people's* concerns. It's even more difficult to back away and grant any tangible, direct and immediate reality to the overall framework within which our individual lives are situated. Still, we are certainly aware that we're not individually responsible for our own existence. Our existence now is a result of events and processes which extend through space and time far beyond our immediate awareness (almost incomprehensibly far beyond, as I'm sure Kim will point out to us). These processes, some of which we'll be hearing about tonight and tomorrow, are alive within each of us, embedded in the structures or systems through which our consciousness emerges. In the earth's ecosystem that we're a part of, and even wider to include the sun, the other stars, etc. Processes external to us have put us here, and continue to maintain the circumstances in which our state of awareness can persist.

So here's where science enters the picture, I think. There *are* external constraints placed on us, limits on what we can do and how we can do things, and one way to view science is as the recognition of these external constraints, and the process of understanding them. We can use science as a way to look at the patterns of constraints that we experience in the world, and as an organized way to make progress in discerning and piecing together some insights into what the universe is doing as a system. Is it producing structures of gradually increasing complexity, by some measure of what "complexity" means? Is it generating structures that have a chance to produce consciousness? Or probably something we haven't thought of yet. But if we approach it from this perspective, with this goal consciously in mind, then I think science actually has a lot to say about the overall context in which any meaning we give to our lives is grounded. But only if we consciously approach it that way.

As a general analogy for the perspective or use of science I'm talking about, I like to imagine finding ourselves placed for a minute or so on the stage of a several hour long play. So we have a very small fraction of the total performance time to look around at the way the stage is set, at the costumes and props, maybe hear a few words of what the actors are saying (perhaps in a language we don't understand and must translate), and try to figure out something of the plot and the story of what is happening in the performance, and to figure out what role we could play in it, if any. After all, if we're there on the stage, during the performance, maybe there's something we're supposed to do, some part we play, that we don't know about yet.

The aspect of science I'm talking about consists of looking at nature in a way very similar to what we're doing in the case of the play. This weekend we'll explore a few of the insights of modern physical science in this way: with an eye toward identifying what light these insights can shed on our individual efforts to figure out

our role or place in the universe.

And this effort itself is just a part of what I see as the more general challenge before us, which is to ask: How can we present science (and also practice science) in such a way that it *invites and encourages* people to naturally assimilate its key insights as part of their individual worldview - building process? This challenge opens up many important issues and questions and problems, some of which I'm sure will come up in our discussions.

(slide 2)

One major issue I want to touch on now might be described as the *tension* between the kind of meaning or context for ourselves that we develop *internally*, in our minds, and the observations we make of the order and rules of operation of the *external* world we are a part of.

The meaning we give to our lives comes from creating a context, a story, with ourselves clearly located somewhere in the picture, somewhere on the map we make up. But we know that not every story we make up in our minds is true in reality - we know we can be wrong, can believe things that are not true. So we feel compelled to be intellectually honest - we want any meaning we construct for ourselves to not be an "illusion" in some way; we want it to be on solid ground, to be based on the "real world." Science has worked so well in predicting and describing things about the world, enabling us to gain control over it in certain ways, that it is very difficult to deny it a central role in telling us how the world *really is*.

This is the key point of contact, I think, between the perspective of science, and the immediacy of our individual experiences with daily life. I know I am a product of things I did not choose, did not have control over. Yet I am immediately aware of having choices, of the need to make decisions about what to do next. I feel a strong need to make these choices be in harmony with whatever is behind the forces that brought me to this point, the point where I exist and am conscious of having choices to make. (Just like when I'm on the stage of the play, aware that something is going on that is outside of me, that I want to find my role in). So I feel compelled to try and figure out something about the overall context, in order to make decisions that are true to it. If I had no control over anything, then I would not care so much about knowing the overall context of nature, because I would not need it in order to make good choices - they'd already be programmed in. On the other hand, if I had *complete* freedom, I also wouldn't care so much about understanding the context. In that case, I could make my own context, without feeling tied to an external one. But we're caught in between these two extremes: uncertain and free to choose, but also aware that we're a part of something very important that we did not set up, which we feel obligated to remain true to.

So this becomes a problem when we get caught in a tension between our internal need for meaning, and the kind of “maps” typically provided by science. We know science is in some way telling us about the real world, so we need it. But the science by itself usually doesn’t tell a story with a clear place for us in it - it leaves most of our concerns out of the picture. Maybe for good reason, but scientific descriptions are often abstract and have nothing that brushes directly against the universe we *experience* in everyday life, the universe of our feelings and hopes and wishes, etc. In the words of Bryan Appleyard, a very thoughtful anti-science spokesperson,

“On the maps provided by science, we find everything except ourselves.”

- Bryan Appleyard (in Understanding the Present)

Science seems to cover all there is to know about the world in some way, yet it leaves out what to us is the most important part.

But where Appleyard suggests that we must therefore resist and reject science because it doesn’t have a clear place for us on its maps, I think we just need to recognize how new many of the insights from science really are in our history. Even some of the most basic and fundamental insights from science are only a few hundred years old, not very many generations of people. There hasn’t yet perhaps been time to assimilate them. That’s what we need to do. It’s time to start being more bold in our thinking - time to take the science seriously, use it to direct our questioning process, and use it to ask, “what could be a meaningful place for us, given what we know?” How do we allow science to touch the problems of life, and provide maps that put ourselves on them in a way that is satisfying to our inner needs for meaning, but is also consistent with what we learn through science about the universe?

There are not yet very many serious forums for looking at the science, and saying, ok, what could that realistically tell us about our place in things. I’d suggest that we’re at a very exciting beginning point, that now is an opportunity to be more daring in coming up with real scenarios to start the process. Ask of what we learn. “Given that the universe works this way, what could be going on, what could be behind things, what could be a way that we fit in and have a role?” As Edwin Dobb points out, we might want to shift our emphasis “... from trying to discern the structure of the universe to trying to reckon our place within the structure...” In your packets you have a sheet of paper which invites you to take a stab at beginning this process - anonymously- and if you put your attempts in the box Claudine has outside, we’ll collect the ideas together and put them on our web site after the conference, as material for all of us to build from.

(slide 3)

So here are the 3 questions you've seen in the registration material and that we'll revisit on Saturday, which I'm suggesting just as a framework for structuring our progress in these issues.

How have the major concepts, insights, and developments of physical science influenced public perception of our "place" in the universe? (articulation; bringing concrete examples onto the table)

What problems and conflicts has this influence caused? (bring to the surface the kinds of problems we've experienced, conflicts we've felt)

What can be done to facilitate better incorporation of physical science insights into our everyday lives and perspectives, in a positive and constructive way? (action plan - where do we go from here?) How can we use science in a constructive way to help us build a sense of meaning?

Details of how things will run:

Each of the speakers will spend about 45 minutes giving their perspective on their subject, with an emphasis on how the findings of their subject has influenced their own worldview, and an assessment of the kinds of things that seem to influence others' perspectives. We'll leave at least 15 minutes for questions and discussion, about the particular content of that talk.

On Sat. afternoon, we'll have an opportunity to pull everything together, drawing the ideas from all of the talks into an organized but open discussion. (The ideas generated from this will be up on our web site after the conference, for you to refer back to and build from).

I've been talking fairly abstractly about this approach to science. As a final lead-in to our speakers, I want to offer a concrete example of what it looks like to take a particular idea or result from science with an eye for the big picture insights it provides us - asking "What does it mean to me, what does it tell me about my context, my stage, that the world is like that?"

from "What Do You Care What Other People Think," Richard Feynman (pp. 242-244): Maybe a concrete example of how we might approach the information in the talks:

At the end of a discussion of different values of science:

"... I would like **not** to underestimate the value of the world view which is the result of scientific effort... For instance, the scientific article may say, 'The radioactive phosphorous content of the cerebrum of the rat decreases to one-half in a period of two weeks.' Now what does that mean?"

It means that the phosphorous that is in the brain of a rat - and also in mine, and yours - is not the same phosphorous as it was two weeks ago. It means the atoms that are in the brain are being replaced: the ones that were there before have gone away.

So what is this mind of ours: what are these atoms with consciousness? Last week's potatoes! They can now *remember* what was going on in my mind a year ago - a mind which has long ago been replaced.

To note that the thing I call my individuality is only a pattern or dance, *that* is what it means when one discovers how long it takes for the atoms of the brain to be replaced by other atoms. The atoms come into my brain, dance a dance, and then go out - there are always new atoms, but always doing the same dance, remembering what the dance was yesterday.

When we read about this in the newspaper, it says, 'Scientists say this discovery may have importance in the search for a cure for cancer.' The paper is only interested in the use of the idea, not the idea itself.

Hardly anyone can understand the importance of an idea, it is so remarkable."

My hope is that someday science will play a much more central role throughout society in our varied individual efforts to construct an overall context for our lives. I hope we will learn to see new discoveries in basic science not as detached and esoteric curiosities, justified by the vague possibility of technological spin-offs, but as crucial pieces or steps in the process of uncovering humanity's role in the cosmos. I hope this meeting will help bring this day closer, by allowing us to work together in developing the point of view from which science is seen as an important tool in our personal searches for meaning in our daily lives.