

THE OPEN MIND

HOST: Richard D. Heffner

GUEST: Dr. Paul Nurse

TITLE: Are scientists keeping the trust of the public?

VTR: 01/20/06

I'm Richard Heffner, your host on **The Open Mind**.

And a constant theme identified with the distinguished scientist who is my guest today, one running through his writings and musings, has essentially to do with the two-way dialogue he finds so necessary between scientists and what he calls their paymasters ... the public.

He insists that scientists need to listen better to the general public.

And he asks whether scientists are, indeed, "keeping the trust of the public".

Well, quite appropriately, this singular concern is expressed by Dr. Paul Nurse – SIR Paul Nurse – Nobel Laureate in Medicine, formerly Chief Executive of Cancer Research in the United Kingdom, and now President of the prestigious Rockefeller University.

In an editorial just published in "Cell", one of the nation's leading biomedical journals, Dr. Nurse notes that, "In recent years ... the communication of science to the public has much improved ... But this communication has usually been only one way, from the scientist to the public, which does not reflect a true dialog."

Scientists, he believes, must equally hear the public's concerns.

Moreover, he writes "Scientists should become more engaged at [a] grass roots level, not just with ... intellectual elites, but with all parts of society in all parts of the country."

Now that noted, I would ask Dr. Nurse just what he means when he warns that: "Scientists need to earn the trust and confidence of the public if we are to retain our "license to operate". What do you mean by that Dr. Nurse?

NURSE: "License to operate", I like that term because it has within it the sense that, that maybe we won't always be able to operate. Because science is an expensive business. Science is difficult for the ordinary public to understand. We have to justify why the very large sums of money which the public, through their taxes use to support science ... why is that necessary? Isn't science sometimes rather frightening? Doesn't it make life more difficult? That's what people think.

We have to show them, we have to show the public that science is very helpful to them. It does raise very important issues; sometimes that go to the very root of their understanding of their lives and their beliefs. But these are issues we have to have dialogue about because just to throw science away ... just because there's difficult issues ... would be a great problem; both for the health of the nation, the generating wealth, for having even a better environment.

There are great issues at stake here. I'd even say science is key to democracy. Because science now touches so much in all our political decisions that unless we can somehow engage this difficult subject with the general public, I think there are serious issues ... not only for scientists, but for democracy as a whole.

HEFFNER: Paul I ... I rather gather from reading this extraordinary article you've written in "Cell" that you, in a sense, fear that we have already come to the point at which we, as a society are pulling back from the support of the scientific endeavor.

NURSE: I have some concerns about that. Because the United States has had such a great record in embracing science, in embracing a rationale view of the world and using the knowledge that science can bring to benefit humanity. We've seen the really important position that the US has in science and in the commercial world, and those are connected.

Because understanding that science brings, drives commercial innovation. Understanding that science brings ... improves health. These are important things based, I sometimes argue, on the principles of the Enlightenment which motivated the foundation of this great Republic.

They are core to the Republic, they are core to science. But sometimes one senses both from things one reads about certain communities, societies and groups, even I'm afraid from the political leadership, that science isn't being taken seriously. That there is a little bit of a stalling of this whole enterprise which has served the United States, and for that matter the world so well.

I do have concerns about that and I think better dialogue will help in that issue as well.

HEFFNER: Has science done a better job at dialogue in other parts of the world?

NURSE: I think dialogue is still pretty early throughout the world. As you mentioned I, I happen to think that public understanding of science, which was new in the seventies and eighties, really ... in, in a big way ... has done very well. What we've seen good books, if you go to a book store you see really good books for those that are interested. Good programs on the television ... hopefully getting to all of the public, because there is a problem that we make programs that will interest the more intellectual individuals. We actually have to reach a wider part of the population.

But that, that's an exercise I think is going well. One of the not so certain we're doing well is this dialogue business. And dialogue means listening to the public. Scientists sitting down and talking to the public, just like you and I are talking here. And hearing what Joe and Joanna Public think about scientific issues. And what bothers them about science because science can be worrying. It can be ... it can be fearful, it challenges beliefs. It, it can even really disturb people. We have to know about that. It's no good us sitting in our ivory towers remote from that.

I'll give you an example from my experience in the United Kingdom. Genetically modified crops, which were mostly accepted in the US, not, not completely; have been almost totally rejected in Europe. When this was being analyzed after the event ... I asked some ordinary people what really bothered them about genetically modified crops? And they told me what really bothered them was that they had genes in them, genetically modified crops had genes in them. Now scientists would never even think of that because they know all crops have genes in them. But this was what was bothering the public. We never even asked them to find out what the issues were that concerned them.

We would put "adverts" out, or Monsanto would put "adverts" out ... we would have television programs about this issue, we never would consider what really mattered to the public. That's just ... that's just plain dumb, quite frankly. It just doesn't help at all. But there are ventures promoting dialogue in other countries. I think the US maybe a little bit behind, but not very behind because it's new, really, throughout the world.

HEFFNER: What fascinates me, Paul, is that in what you say you are giving expression to the scientific endeavors emphasis upon reason, rationality. You make it sound as though, as if you and your fellow scientists are reasonable and rational in your approach to the public, that that's it. You've solved the problem. Do you really think that's true?

NURSE: No, I don't. And if I've given that impression it's a mistake. I think science is reasonable and rational. At least most of the time. I think scientists are human beings and we suffer from all the great things about being human and all the things like subjectivity and the like which mean ... we are not always the people who have the right answers.

The way science is done is rational and self correcting. The way scientists operate are just like any ordinary person. In fact, I want to emphasize that we may not have the answers and that's one reason for talking to ordinary people. So within a dialogue a more constructive solution can emerge.

I mean there are difficult issues. I mean stem cells, for example. I mean these ... this is a very important issue with great ethical consequences. But we need to discuss this properly in society as a whole, so we can a sensible approach to it.

I don't really see that happening in the United States. What we tend to see are these single interest groups banging on the table about particular positions. We

see confrontational type debate which I don't think science actually responds well to.

I think we just have to have a more polite, courteous discussion about these crucially important issues so we can find solutions to some of the, these problems, which society as a whole can accept.

HEFFNER: Of course that's, that's made more difficult ... there was something that I noticed in particular, in reading many of the things that you've written.

You wrote that many of our beliefs in society are, of course, based upon ideas that are millennia old; but that science and the scientific pursuit is revolutionary.

Now, how do you, in dialogue or however ... how do you bring together that, that combination of the threatened and the threat?

NURSE: Well, you're right to point out science is revolutionary. It's the truly revolutionary movement of the last five hundred years.

I mean from Galileo and the sun centered universe onwards. And science challenges beliefs and sometimes in really quite violent ways. I'll remind you ... Galileo was shown the instruments of torture because he believed that the earth went round the sun, rather than the sun going round the earth. I mean this was important stuff. So it's always been an issue.

Now how do we deal with it, as you said. How do we cope with the fact that if somebody believes something which their predecessors, or their particular religious community has believed for 2,000 or more years ... I mean how do you actually cope with that?

Well, there can be movement. Galileo is no longer a banned author in the Catholic Church. I mean there has been movement there. Because often the conflict between science and religion is more apparent than real.

Science doesn't really challenge those basic tenets of religion that deal with the values and how you live your life in quite as much a way as many people think. There are certain beliefs, like the geocentric view of the universe which are not core to those teachings and they can be put aside as ... with a proper discussion and dialogue of these issues. I don't pretend it's easy. It isn't easy. Because these are really important beliefs.

Stem cells gets to the issue of when does life begin? I mean it's the abortion debate all over again. It's very, very difficult to define when a living human being really starts to live. And there have been all sorts of definitions in different cultures in different beliefs ... from the fertilized egg, on to a fetus with a beating heart, on to a baby who can live free of its mother's womb. There's a whole continuum here. And science can't tell you when life begins. It can tell you when certain steps occur. You know, when a nervous system develops. When a fetus can begin to move. When it can live freely. It can provide information.

But it is dialogue and discussion within society which has to decide which of these criteria are important. And therefore the right point to make this decision about when a life is being murdered and when we don't yet have a life. This is central to the abortion debate; it's central to the stem cell debate.

HEFFNER: What role do you see yourself and your fellow scientists, do you see Rockefeller University playing in this exchange? In this rational dialogue?

NURSE: I think we have to get out there more, actually. Scientists are very busy. They are a very intense tribe. They are very curious. They work extremely hard and those who are working in the public domain ... many make, actually, not much money. I mean there's ... there is a bit of a myth around that scientists do it all for the money. Simply untrue.

Most of my colleagues are really not much better off than church mice, I have to say. So that, that's an illusion. They don't do it for that, they do it because they're intensely interested. Getting them diverted to do other things, like talking to the public, like writing articles for *The New York Times*, they find distracting. To write something would take a day or two days. It takes them away from the laboratory. It takes them away from supervising their graduate students. It takes them away from talking with their colleagues. Some are reluctant to do it. Made even more reluctant if they have an experience and then get beaten about a bit. Which is often what happens. Have to be quite robust.

They get put off even more if they think people don't understand what they're, what they're talking about. We have to put all that aside. If we want our license to operate ... the term you used ... we have to get out there, we have to talk to the public, we have to listen to the public, we have to persuade them and of ... the worth of science, but at the same time deal with their fears about what science is discovering and what science can do. We have a real responsibility as a community, a scientific community to take that on.

HEFFNER: Well, Paul, you, you very kindly attribute to me all of the wonderful expressions that I have cribbed from what you have written. I want to ask whether you feel that today contemporary Galileos are being shown the instruments of torture.

NURSE: We are. I have to say I think we are. Let's go back to the stem cell issue. We have a very confused and muddled legislation at the present time. Stem cells that were made before a date, an arbitrary date ... September 2001 ... work on such human embryonic stem cells can be supported by Federal funding. By the government.

Such cells made one day later, in October 2001 cannot; it's illegal, we wouldn't be allowed to do it, using, that is, Federal funding.

Now this means, in an institution like mine, if I want to support work on cells made after that date, I can do it with private funds, not with government funds.

But I have to have a complete quarantine, a complete separation of the funds from the Federal sources and those private sources.

Now, should it be ... this is perhaps theoretical, but ... should it be that one small plastic tube bought by NIH, that is on Federal funding, ends up in a laboratory being used to study human embryonic stem cells, isolated after September 2001, *all* the Federal funding in my institution is at risk. We could all be closed down. This is the equivalent of Galileo being shown the instruments of torture. In my view.

What we have here is a climate of fear. What this leads to is administrations like mine being really worried about this research, not because the research itself is illegal, we can fund it. But because it's being made so difficult to do it that one small mistake and we close the whole operation down. I think this is a climate of fear. It leads also to fear within our colleagues. They are bothered if one of their colleagues is doing work which might be at risk, that they might be at risk. They will become increasingly conservative in these circumstances.

Not only was this legislation confused, I mean because it's arbitrary dates. But it's also very fearful. I think this whole issue has to be looked at again and has to be discussed in a way that I think will lead to more sensible and rational outcomes.

HEFFNER: Paul, have you seen this chilling effect at work?

NURSE: If you walk down the corridors of my institution, people are highly concerned about this issue. If I go to conferences, it's a major topic ... "is our funding going to be put at risk? Should x being doing the work they're doing ... because ... isn't that potentially going to lead to a problem?"

This is not the sort of atmosphere where curiosity driving advances in science can prosper. It is a problem. I don't want to exaggerate it as a problem in the sense that work continues. We continue what we are doing, but it isn't healthy.

And something else I don't understand about this. If this whole issue is such an ethical problem that society as a whole found it repugnant, why is it legal for me and my institution to support work with private funds? Why only exclude it from public funds? None of this makes any sense. We have to revisit it.

HEFFNER: Ah, you say it doesn't make any sense. There's the rational scientist. You know that it's a political matter.

NURSE: It is a political matter and I don't think our politicians are listening to scientists and doctors about this matter. They are looking at constituencies that they consider more important than their scientific and medical advice. They're looking to gather support from communities that are frightened and concerned about this issue and if they are ambivalent about it, and the policy, as I said, is ambivalent and it's confused, it's because they're trying to let a bit of work go on and at the same time not alienate certain constituencies.

What they are not doing is showing leadership. Leadership which says, "Here is an important and difficult issue and I, as a political leader, have to show leadership over this to show the direction in which we should go.

What we are seeing is simple response to opinion polls, one percent there, two percent there. What we need is leadership over this issue. What we need is better dialogue; better discussion so that the politicians will take science more seriously because the public will take science seriously.

HEFFNER: Are scientists doing what they need to do to foster, bolster this needed leadership?

NURSE: I'm afraid we're not. I mean I've already remarked, and I'm as guilty as anybody ... that taking the time to do this is a distraction from what really interests us. But we have to do it to keep our license to operate.

I also think our scientific political leaders need to do more. Those who sit at the top of our major institutions; they have a tremendously difficult job. I have every sympathy for them because they have to somehow bridge between the scientific community and the political community and they can't, they can't compromise their position. They have to somehow try and keep everybody on board. But there are certain issues over which they shouldn't budge.

Let's take intelligent design. Intelligent design, the other major issue ... one of several actually, but the other one beyond stem cells that are particularly agitating biologists and biomedical scientists ... there are forces through ... in parts of the country that wish to see intelligent design, a form of creationism, to be taught as an alternative to Darwinism, that is evolution by natural selection.

Now the reason this has caused such controversy and it has to be said, it's caused controversy in the United States for a century ... there was a trial about this in the so-called Scopes Trial in the 1920s. And we're still having trials today. The reason that it's caused such controversy is that creationism, or intelligent design ... I mean intelligent design is a form of creationism where a supernatural being, a god-like being, intervenes with the evolutionary process. So, sort of tinkers with how animal and plant evolution changes.

This is not science, but its being taught as science and this is where the key issue is. If somebody of certain religious views wishes to believe that and if they wish to debate whether this is the way that God intervened with evolution or did he create it all in seven days, as in Genesis. That is fine.

What is of concern here is that it should be presented and taught as science. Because it is not science. When we do science we cannot envisage supernatural forces. What this would mean is that if I had something happening in my test tube that I don't understand ... can I say, "Well, maybe a supernatural influence caused this." You wouldn't take me seriously.

Now we need leadership about this and I'm afraid that sometimes we don't get it. A leader of one of our great Federal funding agencies ... when asked whether NIH should take an issue on this said, "Why, why should it?"

And I'll say why it should, because microbes becoming resistant to antibiotics are evolving by natural selection. If they are changing by intelligent design, the NIH should be changing its entire way of approaching ... its entire research program for dealing with antibiotic resistant bacteria in hospitals.

That's why NIH should have a position. That's why the leaders of our Federal organizations need to take strong positions over those issues that really matter. And why I'm speaking so passionately about this, is that it does really matter if there's an issue which simply undermines science and the whole way you approach science.

HEFFNER: You seem also in your article in "The Cell" to be saying, on a very practical level in terms of recruiting the kinds of scientific talent we have always recruited. That has flooded into the United States and helped it be a leader, scientifically, as you suggested at the beginning of our discussion. That that's being cut back.

NURSE: Yes, this is unfortunate. I don't think this is deliberate frankly, I think it's just an accident of where we were ... where we find ourselves. I mean the U.S. is a great magnet for scientific ability and general intellectual ability from across the world. And has been for many years. It's one of the most attractive features of the U.S. community that it can open its arms to immigrants from all over the world and the country has profited enormously from that.

And we've seen that with different ways of immigrant. In the case of science where, where the recruitment of immigration ... or the visits ... are of highly intelligent, highly skilled scholars, this is of great help to the U.S.

In fact, it's not only of great help, it's probably essential because the U.S. is not even producing enough of its own scientists and technocrats to be able to properly support the scientific and technological enterprise. In short we are reliant upon this immigration to keep the enterprise going.

Now the difficulty we find our self in ...

HEFFNER: In 30 seconds.

NURSE: ... is ... the difficulty we find our self in ...

HEFFNER: (Laughter)

NURSE: ... is that post-2001, this ghastly attack in New York ... the restrictions on visas and the like have made it very difficult for people to come in. There are attempts being made to improve this, but we've already lost students, we're already losing scientists coming into the country.

HEFFNER: Dr. Paul Nurse, I would never in the world cut you off except that I'm being cut off, you've got to promise to come back because there's so many of these issues ... many more issues that I'd like to discuss with you.

NURSE: It's been a great pleasure being here. Thank you very much.

HEFFNER: Thank you, Dr. Nurse. And thanks, too, to you in the audience. I hope you join us again next time, and if you would like a transcript of today's program, please send \$4.00 in check or money order to The Open Mind, P. O. Box 7977, FDR Station, New York, New York 10150.

Meanwhile, as an old friend used to say, "Good night and good luck."

N.B. Every effort has been made to ensure the accuracy of this transcript. It may not, however, be a verbatim copy of the program.