

EXPLORATION AND DIPLOMACY

Jan W. Vasbinder, 4 December 2019 in Moscow

Nobel laureate Sydney Brenner, who died in April this year, was a great believer in the power of ignorance.

I quote:

"I think you can always know too much.

I feel that one of the problems about being an experienced scientist in a particular field is that it can curtail creativity because you know too many reasons why something may not work. So, I believe that it is people who come from the outside, who have not been entrained into the standard approach, who can see things in a different way, who can take new steps".

End of quote

Another quote, also from Sydney:

"There are people who will not say anything until they've got it all worked out.

I think such people are missing the most important thrill about research – the social interaction, the companionship that comes from two people's minds playing on each other. And I think that is the most important thing: "To say it, even if it is completely stupid"."

End of quote

I feel these two quotes from one of the greatest scientists of the last century, legitimizes me to go on and talk about exploration and diplomacy. I am ignorant about most issues that you as scientists consider to be very important, and I am not a diplomat.

One more quote, also from Sydney Brenner:

"The great thing about science is that you can actually solve a problem".

The important point to remember as I talk about exploration and diplomacy is that the nature of the science that Sydney Brenner refers to, is changing. Because it is changing, the context within which "science and diplomacy" gets meaning, is changing.

Let me elaborate a bit on this and lay out the essence of my talk:

- 1 The nature of science is changing: its focus is shifting from parts and pieces to coherent wholes. This new way of science befits the *grand challenges* that confront humanity and that are characterized by problems of enormous complexity and seemingly impenetrable webs of cause and effect. The umbrella name for this new way of science is *complexity*.
- 2 Instead of looking at objects of study top-down in a reductionist manner as has been done for four centuries, complexity science seeks to look at its objects of study from the bottom up, seeing them as systems of interacting elements that form, change, and evolve over time.

- 3 As a result of these changes, the combination of *science and diplomacy* the way it has evolved in the last fifty plus years is losing its relevance, because the context within which it was relevant, is changing.
- 4 We need to explore how the new science of complexity can be combined with effective interactions across the boundaries of traditional scientific disciplines, institutes, nationalities, or generations.

I would like to make the point that the many paths along which human societies have progressed have been marked by individuals with daring and explorative minds and bright original ideas. These adventurous explorers dared to take steps in the unknown and by doing so opened up new perspectives for humanity.

Explorations, I think, provide the keys to a better future for all.

To me, science is one of many ways in which humans explore their world. It is a formalized, methodical way. But it is **nó**t the **ó**nly way.

Science is defined by the people working in it.

It is also defined by the methods these people use to find a solution to a problem.

Science is **nó**t about picking the right problem.

A "right problem", from the perspective of a science that befits the grand challenges, is a problem that focusses on ways to deal with those challenges, such as the change of the world climate and all the consequences that come with it.

The possibility to do science is not within everybody's grasp, the possibility to find a problem is.

Sydney Brenner was a genius in finding the right problems to work on, and then in finding solutions to those problems. But for him, as I mentioned before, the social interaction, *the companionship that comes from two people's minds playing on each other, were the most important things in science.*

Only a small part of that interaction deals with the need to communicate and externally verify the results with others. To meet that need requires that the methods used for solving the problem are clear and agreed upon and that research is carried on along those methods. But that is not the point I want to make.

That point is that *broadening of horizons, better understanding of our world, improving insights in its functioning, takes place when two minds that are focused on exploring the world, interact.*

Interaction between individuals is the key to diplomacy. Without such interaction, there *is* no diplomacy. It may also be true that without diplomacy constructive interactions may not develop. In fact, the **bigger** the political, cultural or historical differences between two parties who **may** have a common goal to solve the problems of the world, or to ensure its safety, the **bigger** the danger that, **without diplomacy**, interaction will not develop or actually stop.

That risk seems even bigger when both parties start from positions that have long been established and that thus, for each party, have become the natural context from

which they view the other. Such localized and biased views of the other stand in the way of a constructive dialogues about issues of common interest.

So, it has come to be that *science, as an activity that is executed in a formal and methodical way, independent of a localized context*, is thought of as a safe, and stable platform for a continuous social interaction that may create space for constructive dialogues.

Which is the *reason* for combining science and diplomacy. Science provides a context or *holding pattern* within which we can keep a conversation going. That conversation may lead to new approaches that are anchored in agreed upon methods.

But, does it provide the dynamics and innovative approaches that are needed to find solutions to pressing problems, especially problems that go beyond the boundaries of traditional scientific disciplines, or problems that require globally supported actions? Problems that result from systems of interacting elements that form, change, and evolve over time?

Problems that grow in number and severity as a result of the growing world population, the intensifying global connectivity, the consequences of the collective human exploitation of our planet, and the synergy between these developments?

In my view the stable platform where scientific **analysis** encourages social interaction does **not** support the dynamics that are necessary to find ways to cope with such pressing problems.

Here is the *fundamental reason* why:

All the big challenges that humanity faces are expressions of a complexity that has mostly been ignored by western science. The development of that science during four centuries of enlightened thinking was strongly influenced by reductionism. In essence reductionism means that problems that cannot be analyzed with the tools and methods at our disposal, are decomposed into smaller problems that can be analyzed and solved. We then trust that the solution of the original problem follows from a linear combination of the solutions to all the partial problems. However, more and more we find that that trust is misplaced and that the solutions we construct by combining the partial solutions, do not match the problems we tried to solve. The reason is that we are ignoring the complexity of the problems we want to solve.

Humanity is now facing problems that are the consequences of that institutionalized neglect of complexity.

The concept of science and diplomacy was built on methods and formal approaches that originated under a regime of reductionism.

These methodologies are not working for complex problems.

To deal with such problems, the science of complexity is developing, a new science, that requires new methods and formalisms.

That new science must be combined with a new diplomacy in order to become useful for solving the problems of our world.

What should this diplomacy be like?

I cannot say but let me share some thoughts with you that might be indicative of a direction.

The big problems that the world is facing require **actions** that transcend the boundaries of individual nations. **Actions**, because for many of these problems time for doing more analysis is running out.

An example of such a problem is the growing threat of the spread of infectious diseases as a result of climate change. To put it simple: climate change has energized pathogens to move to other areas of the world and find new hosts. They are not waiting at or stopped by the boundary between Russia and Poland, or Poland and Germany or Germany and the Netherlands. Not even by the North Sea that separates the Netherlands from the UK, or by Brexit that separates the UK from the rest of the Europe.

To cope with a challenge of such nature, one needs plans with executable actions. To develop such action plans, one needs to go beyond the boundaries that are defined by scientific disciplines, institutes, nationalities, or generations. To do that one needs interactions that are specifically aimed at developing action plans.

There are no clearly defined methods to do this, there is no common language to do this, and there is *no stability or safety* in the territories beyond the boundaries.

However, we need to go there, all of us need to, including scientists. They need to unless they are willing to go along with the flow that leads to irrelevance. So, here is the challenge for science and diplomacy:

“To find ways to move from a holding pattern to an active explorative pattern”.

To find such ways, one needs to *explore* and be hopeful.

Pessimists, and perfectionists who are looking for perfect answers, will never find ways to counter these threats. To them it may seem that the world is doomed.

Optimists and pragmatic realists on the other hand, people with an explorative mind who dare to venture into unknown territory, **do** see possibilities to discover and open up new fields of human endeavor and understanding that will benefit society in innumerable ways and that eventually will lead to a better world for all its inhabitants. The enormous advances in our understanding of nature (around us and within us) and the ways to use that understanding for the betterment of humanity, were induced by such explorers.

There has never been a stronger need for explorers.

I am sure that on a global scale there is a large number of brilliant and daring individuals who have ideas that they want to explore but lack the financial and institutional possibilities to do so.

Similarly, I am sure that on a global scale there are enablers, fund managers and wealthy people looking for ways to support daring projects that might improve the quality of life for humanity and for our planet in a sustainable way.

The new diplomacy should be focused on finding ways to match explorers with funds and with moral and institutional support to explore and develop their ideas.

That should be the new context for science and diplomacy.

Thank you