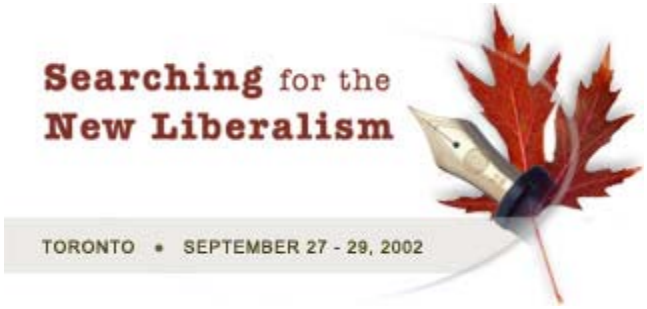

A Liberal View Of Science (Keynote Address)

by John C. Polanyi

It is my hope that The New Liberalism will turn its piercing gaze briefly in the direction of Science Policy as it applies to the universities, where most of the nation's science is done. This is a little-known byway of national policy. Conservatives and Liberals have let it become over-grown with illiberal practice. Not only is this obstructing the traffic in science, it is in danger of invading the wider thoroughfares of policy.

Canadian scientists have too little collective consciousness, and even less of a tradition for political action. Instead the community mutters to itself, in casual two's and three's, rather than constituting a countervailing force to bureaucracy.

What is the problem the science administrator must address? It is to maximize the returns on a considerable investment in university science. The university scientist has the responsibility to deliver on that investment.

He or she must contend with the complexity of nature. It is the highest art to separate the problem one wishes to solve from the hundred other unknowns with which it is entangled. This skill is one which the practitioner can not sufficiently describe, and the unskilled observer cannot sufficiently conceive. For it is a skill which is learnt not from

books but from other practitioners through apprenticeship. Its external attributes can be listed, but they do not provide a basis for judging performance.

The external attributes of scientific discovery include such characteristics as inter-disciplinary research, the formation of teams, and the activity of networking. However, it is not helpful, though we do it, to *demand* these attributes. Nor is it sensible to assess the quality of a scientific research proposal according to the extent to which it embodies these attributes.

But why, apart from the desire of governments to govern, should one want to apply these dubious criteria? It is because they are regarded as being objective. They constitute a form of accountability that can be quantified and appreciated by anyone. That is appealing. The drawback is that it is unreliable.

We would do better to explain that to the public. We must trust them to understand that performance in the arts, of which science is one, can only be judged by those skilled in the art. The process is not new; it is called 'peer review'. Peer review has, in fact, never been used more widely in science than it is today. But what is not acknowledged is that it is being subverted. We will soon be left with the appearance rather than the reality of peer review.

Let me explain with an example. It is an important example. Noting the existence of skill in the performance of science, governments both federally and provincially have set up Centres of Excellence. The title is promising. 'Excellence' is

needed because insights come mainly to the minds of a small group of visionaries. ‘Centres’, because sharpness comes from steel rubbing against steel.

But the description, ‘Centres of Excellence’ is misleading. The so-called ‘Centres’ are often virtual, extending over large regions. Still more damaging, the excellence can also be virtual, since the quality of the science counts for less in judging the centres than the ‘style’ (the elements of interdisciplinarity, networking and management structure, to which I alluded).

To make things worse, the criterion of style is coupled with an assessment of potential for ‘wealth generation’. This depends on an impossible calculation involving the nature of the as yet unmade discovery and the way it will interact with other discoveries to make possible a device. That device must be of such a nature as to bring wealth to the jurisdiction (federal or provincial) of the funding agency. And all this is, optimistically, to be validated through peer review.

This is how it comes about that a puzzled colleague in Bad-Wurtenburg is faced by a form in which he must give a rating to the likely economic benefits to the province of Saskatchewan of some proposed research in non-linear optics.

A further exercise, among many, is the provision of milestones for the research. These cover a several-year period. They can be, categorized as to the particular ‘thrust’, and ‘task’ within that thrust. They are written a year before the project begins. At a suitable later date progress must be reported directly beneath each of the original millstones (as they are sometimes mistyped).

Woe betide the researcher who hares off in pursuit of the unexpected. Fortunately some do because this country has excellent science, in spite of over-management.

But our scientists are asking themselves why they should be required to make discoveries by subterfuge. A few, who are the most mobile, go in search of jurisdictions where it is less necessary to do so.

I leave to you the wider question. Has this new accountability, which in principle we welcome, in practice involved us in damaging exercises? Are senior officials in many areas spending time and money in chicanery, to the detriment of their work?

Of course they are. But I leave the question open, Canadian style.

However, I would like to add one thing. You may think me guilty of hyperbole. What I am really guilty of is stating the problem too narrowly. It is not a problem primarily of bamboozling bureaucrats, but of losing opportunities. To vary the simile, the general in the field observing a gap in the enemy ranks may decline to order a charge. Why? Because winning the war has become subsidiary to following the plan. This has invariably been the undoing of the centralized state.

Let me summarize. It is the mark of creative activity, in whatever sphere, that it surprises. If it doesn't surprise it is re-creative, a hobby. But in order to surprise it must be given the freedom to do so. In scientific research we should insist on the freedom to succeed. Of course we expect to be held accountable. We are not asking for the freedom

to fail, but to be judged on what we do. To judge us in any other way is to ensure that we do less than we might.

I am aware that I have painted on too small a canvas for this ambitious meeting. Science policy is not only thought to be peripheral; it is. It looms larger when one considers that the entire spectrum of creativity is similarly vulnerable. For if liberalism means anything, it means an openness to the changes that the exercise of imagination can bring.

In this important sense to be a scientist is, automatically, to be a liberal. Science embraces whatever change carries the hallmark of truth. So, when a stateless patent clerk in Berne, Switzerland, challenges the greatest living scientists, attention is paid. In short order, Einstein was plucked from obscurity. The Establishment of science rejoiced in the revolution he had wrought.

This ruling body has in fact, been knocked flat a dozen times in the past century, with the advent of new notions of matter, energy, time, life and the universe. The community it rules has emerged each time strengthened by change.

Sadly, but not surprisingly, the liberal imagination of the scientist extends only a little way beyond the laboratory door. But that little matters, as practitioners of politics know. My fondest hope for science is that its habit of renewing itself through change, and hence its tolerance of dissent, will spread beyond its professional boundaries.

The task of the liberal today is what it has always been; shaping a world without war or want. What is new, and science has something to do with it, is that we live in a time of runaway change in which we are being forced to implement that dream. The political scene is mined with explosive information and expectation. And also with explosives.

In a Statement first circulated in July 2001 a group of Nobel prize winners spoke of this:

> The most profound danger to world peace in the coming years will stem.. from the legitimate demands of the world's dispossessed. If, then, we permit the devastating power of modern weaponry to spread through this combustible human landscape, we invite a conflagration that can engulf both rich and poor.
>
> The only hope for the future lies in co-operative international action, legitimized by democracy. It is time to turn our backs on the unilateral search for security, in which we seek to shelter behind walls.
>
> .. To survive in the world we have transformed we must learn to think in a new way. As never before, the future of each depends on the good of all.

By the time, two months later, that September 11th woke up the world, some 35 prize winners had signed. Shortly thereafter the number increased to 110 — the great majority of this international community.

The Nobel Statement was, I would say, liberal to its core. On September 11, 2001 you might not have thought that there were 110 liberals around, particularly since (being Nobel prize winners) they were mostly American. But, in fact, liberals abound, and global realities are in the process of creating more. The president of the United States is one when he excoriates the United Nations for being a paper tiger. The challenge that we face, and I am confident we shall be up to it, is to be more liberal than the president of the United States.

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