January 1995

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Improving the Context of Innovation in Canada

Stuart Smith*

I was asked to talk about the context for innovation in Canada in particular; I hope you will not mind if I do not deal with the general context for innovation, but rather with the specific context in Canada. I will try to explain why we have been trying a number of approaches, some of which seem doomed from the beginning. They are an effort on the part of the Canadian policymakers to cope with an underlying problem which I will discuss later.

The first thing I was going to say about innovation, however, is that we should remember that it is not just technology. We heard that much of what makes for successful firms has nothing to do with technology, but has to do with management, marketing, and a number of other areas. However, if you define innovation correctly, a lot of the management and marketing is innovative. Look at things like design or style. Whole industries, whole countries (for example, Italy) seem to be able to prosper based on fashion and on style. They are able to add value to simple products like leather. So innovation takes many forms, and we should not get hung up on technology as being the only form of innovation. It is not, and it is not even the most valuable form sometimes.

Canada is a country, however, that has never valued design very much, and that is one of the weaknesses. I may say the United States is in the same boat to some extent. The European countries; Scandinavia, Germany, Italy, for example, have put a much higher value on design. Japan has also understood the importance of that. This is a weakness in Canada and I suspect it is a problem in the United States as well. There is a typology of innovation that is worth looking at, and the only reason I mention that is so that you will understand the Canadian problem.

You can look at innovation as "process innovation" or "product innovation." In other words, you can have a process innovation which allows you to produce or provide in a more efficient way. When you enter free-trade agreements, that kind of innovation is stimulated because you are now obliged to produce your current products by the most efficient process possible so as to meet trade competition.

Process innovation is something which we in Canada have been

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The following text was compiled from the transcript of the remarks made by Dr. Smith at the Conference.
doing for many years. We have a good record of innovation in mining, in wheat production, until recently in the fishery, and in the forest industry. Canadians have been pretty good at process innovation.

When it comes, however, to product innovation, that is another matter because that has to be led by the marketplace. It is rarely driven by technology. I tend to believe that there is always innovation around but that the economy draws upon it only at certain times. That is a view which Schumpeter has put, that there has to be a kind of creative destruction which occurs in the existing, rather complacent economy, and then suddenly cracks appear into which innovations can find their way. The point I am making is that product innovations are called forward from the marketplace.

The problem is that to get a message from the marketplace, you have to be there; that is where Canada has a problem. We have for so long been sellers of commodities in bulk quantities to single buyers that we are not truly out there in the marketplace of millions or billions of consumers, getting the message as to what is required to be competitive; what is required to meet their needs.

It is not an easy transition for our country to move into advanced products when we have not been a high-value-added type country to begin with. We do not have many companies who are in that category. Entering into competitive trade agreements has had an obvious effect on our existing industries, but it has not done a terrific amount to call forth new industries. The new industries do come about, but it takes much, much longer for that to happen.

Another way of typing innovations is to look at them as those that let you do better what you are already doing and those that let you do something you have never done. It overlaps partly with the other typology. It is a lot easier to sell somebody a product or process that lets him or her do better what they are already doing, than it is to sell something that lets people do something they have never even thought of doing. To buy the latter, they have to change the way they have organized their work or their dealings with customers. That is much more difficult. Vested interest gets in the way of people doing something which they could not do before because usually one has to change the organization to do that. All of that means it takes longer and is, for Canada, another challenge.

As to the context for innovation, I am sure this meeting has discussed at great lengths the legal context. I am not an authority on those matters. There is also the economic context, which to some extent was touched on previously. What I want to discuss now is the cultural context for innovation because that is a preoccupation of mine in our country.

At one point I was asked about what government can do about the context of innovation. I guess, as I get older, I am becoming more con-
vinced that government has to try, but cannot really do all that much. They can get in the way sometimes and they can do some good things as well, but we have to look at the broader culture to understand what is happening. We cannot expect government to overcome what the culture has prescribed. Let me explain that in some more detail.

We have been discussing regulations, intellectual property protection, various restrictive codes, and so on. There are delays for approvals, and so on, things which are an embodiment of the risk/benefit ratio that a society is willing to put up with at any given moment. When the society feels complacent, people put up a lot of these standards, codes, and regulations to protect themselves against any conceivable downside of change. When the society feels that it must change, that it is not competitive, then they start to shift that risk/benefit ratio and become willing to accept a higher degree of risk. The government cannot get far ahead of the people in this regard. The people have some intrinsic sense of what is the right ratio of risk to benefit. And then the regulations slowly change; there is pressure to change the approvals processes, find alternatives, and so on.

We are living through that right now. I think we can see that people want to have faster approvals for drugs, for example, easier approvals for environmental projects, and so on. People are saying, "Listen, at this point you are protecting us against a very minimal risk, but at the same time you are holding up some really major economic possibilities. Let us shift a little bit." That is shaping the legal context.

But when you come to the cultural issue, this can be a problem. In Canada, our economy has been one of commodity production and branch plant manufacturing. Innovation under those circumstances has a number of characteristics. If you are in the commodities business, a little innovation goes a very long way. You do not expect a steel company to spend ten percent of its revenues on R&D. That would be suicidal. A small amount of innovation becomes embodied in a major process costing hundreds of millions of dollars, and it goes a very long way.

When Canadian government scientists discovered how to put a new, hardier strain of wheat into the ground back in 1910, that stood the Canadian economy in good stead as the leading wheat producer in the world for over seventy years. Eventually we came up with canola, and that is another thing which is going to last us for a very long time. So one little change can do a tremendous amount for a very long time.

Secondly, in a branch plant economy, you become dependent on innovation from outside. Our largest manufacturing industry by far is the automobile industry in which we design absolutely nothing. We do not decide what to build, we do not have to do the market research. We
merely manufacture the automobile. We are quite good at it. There is some innovation in the way we manufacture. We have some good robotics, and we have some very highly skilled workers. Our auto parts industry uses new materials and so on, but generally speaking a branch plant economy tends to become dependent on outsiders’ innovation rather than being driven to do its own.

So it has not been part of our culture to say you must innovate to live. That has not been our culture at all. In fact, if anything has characterized our culture, it is that we could depend on the rents from our commodities and we came up with a way of dividing these rents in a very equitable and fair manner. We have a society we are very proud of in Canada because we have found ways, in the form of health policy, for example, to share the rents equitably.

Unfortunately, that is fine only as long as the rents are being produced in large enough amounts. When you have to figure out how to make money rather than share it, then our habits become a problem. Our labor unions and our citizens generally are better at insisting on how to share it. These habits have become counterproductive, and we in Canada are now in the difficult position of having to change that culture. Cultural change takes a very long time, and we have to hope that the world gives us time to do it.

Of course, our commodities tend to fluctuate in value. At the moment, we are on a bit of a good wicket. For example, fiber is expensive now, and we produce a lot of it. Unfortunately, these fluctuations mask a downward trend in the terms of trade for our basic commodities. This trend has been going on now for some thirty or forty years and will continue into the future. But it does not seem to matter to the average Canadian. It is the old story of the pigeon and the food. If you want to keep a pigeon pressing a bar, as some of you in psychology will know, the best way to do it is to occasionally reward the pigeon. If you reward the pigeon for a while and then stop the rewards, pretty soon he stops pressing the bar. But if you throw in the occasional reward now and then, the pigeon will keep pressing the bar forever. Even if you stop rewarding him after a period of time, he will just keep on pressing the bar.

An occasionally rewarded behavior is very hard to eradicate. We Canadians persist in the belief that when things are down, they will be good again one day. Then there is an upturn and we say, there we are, we always knew that. All you have to do is sit tight, wait out the trough, and the peaks will come again. Of course they do, but nobody notices that these peaks are always just lower than what they were earlier. Our dollar is no longer at $1.05 U.S. It is now seventy-three cents (U.S.), and in terms of what it is against European and Asian currencies, it is far worse. Yet Canadians keep believing that they just have to ride out these waves and everything will be okay.
Let us now look at the various "elements" of innovation. First, there is applied science design developmental engineering. The country has a lot of tax credits for R&D and has programs from the National Research Council to help firms commercialize technology, but we lack applied science and technology development. As I explained earlier, there are reasons for that.

A further peculiar twist is that, given that our economy has been dependent on our forests, lakes, rivers, and wheat fields, the government has been the site of most of our applied research. What little applied research the country has is mainly inside the government. That is not a very useful place for it if you want to get it into commerce, so some of us have come up with ideas about how to solve that problem.

My company privatized a government laboratory to try to get government scientists in contact with the marketplace. We reasoned that, if they had to face market forces when they made their research decisions there would be much more commercial benefit. We proved that to be the case at the Wastewater Technology Center which we privatized four years ago and which has been making a pretty good profit, at least for the last two years. Furthermore, that became the basis for a large water company of which I am now the president. We are doing work in various parts of the world, using the talents of these government scientists. So the lack of applied science is a problem. We have got too little of it, and much of it is in the government.

A second element is management and marketing. I mentioned earlier that we do not have much experience in product marketing. But there is another experience we do not have; when your companies are really branch plants, you do not develop the managers who know how to run a whole company, not a truncated one that takes the product from elsewhere and acts as a warehouse or as a distributor. You need experience in one that actually knows how to organize everything from the product design, to the engineering, to the marketing, to the financing. You do not develop capable managers without that experience. They end up going just so far in the Canadian branch, after which, if they are really good, they get snatched into the foreign parent company.

In the United States the people starting these firms are themselves or else they can find people who have been in the larger companies and can then grow new ones. Our business schools try to solve the problem, but it is a very difficult one.

Another element is financing. What we find in Canada is that we have to start financing smaller businesses because we do not have the value-added large businesses. We have a few with great successes, but basically we have to grow small ones into big ones, and that is not an easy thing to do. The financing is rarely available because banks and venture capital companies find that it takes too much time to guide and
take care of these small companies. It is just not worth the time taken and risks that are involved at an early stage.

Similarly, intellectual property is something which our lending institutions do not know how to value. They have had no experience with that. They are very good at valuing real estate, although they have had some very unfortunate recent experience; at least they know what that business is about. They certainly know how to evaluate a mining opportunity and so on, but they do not know how to evaluate intellectual property. On occasion, I wonder if we could have an agency which actually tries to set a value on intellectual property. Perhaps the government would then guarantee some of the loans that are based on that evaluation. Whether that is feasible, I do not know.

Another possibility to deal with financing would be to remove capital gains tax on any investment that is held for five years. Many small companies have to count on longer-term investments; if you can remove capital gains tax on investments that are held and possibly make up for it by increasing the capital gains tax on investments that are disposed of in one or two years, that might help us to some extent.

Similarly, the United States has the SBIR [Small Business Innovative Research] program, a very useful program which we in Canada should emulate. I have been trying to get people to do it for some time and we will find out in a few more months whether I have succeeded. Prototypes are very hard to finance in Canada. The government does some of that, but the SBIR program is one way to bring that about.

Another element of innovation is the work force, of course. Many incremental innovations, not huge ones, but significant little improvements are actually made by the work force, and I have talked to many Japanese businessmen who have told me of individual improvements which come from the work force in the form of recommendations and suggestions. Our work force is not there yet. At least our labor leaders are starting to welcome innovation instead of resisting it, and that is a start.

Now, of course, the shortest way to encourage innovation among workers is to do profit sharing of a significant kind. If the workers are given some degree of job security as well as profit sharing, then recommendations to improve efficiency are seen as favorable instead of as being against their interests. Our firm has just taken over the management of the water and sewage works of Hamilton, Ontario. About half a million people are served by these. We have a staff of about 150 people. When we took them over, I promised that no one would be laid off as a consequence of our assuming control, but attrition would be allowed to occur, and we would not necessarily replace people as they left. We knew that a fair number were going to retire. I also said that we would give them a fifty-cents-an-hour raise plus ten percent of any money we saved compared to the costs under the municipal govern-
The region, whose work we were taking over, were spending $18.7 million a year. We agreed to give them $700,000.00 a year right off the top because we suspected we could save that amount of money and more without laying off staff. After we achieve those savings (to break even), we get to keep the next million, and after that we split it 60/40. It is a public-private partnership.

Even though we have just taken it over in January, the union has already inundated us with suggestions for improvement. We are now saving money at a rate that suggests we will break even in the first year and should fairly easily make the million next year. By the year after that, we shall be sharing savings with the region in addition to the $700,000.00 they have already saved. One reason for that is that when fourteen positions became vacant, the union did not pressure us to fill all fourteen positions. They can accept that we fill one or two and only when a good case can be made. The staff is on our side because they want to make that ten percent bonus. They are confident because we will not lay them off. They know that, if necessary, we will find something else for them to do or possibly bring them into the parent company.

For example, we are starting an international training program. We are now getting orders in Poland so we may send a couple of them to Poland for a while. So they are on our side. If you want to have a work force that is in favor of innovation, you have to share the wealth with them.

Finally, you have the issue of the nature of the market. It really helps to be in a country where there is a market for innovation, where somebody actually wants what it is that you think you can produce. In our country, our big companies certainly are in the market for process innovation. There is no doubt about that. However, as I have said, we do not have a feel for the market of knowledgeable and keen consumers seeking new products because, basically speaking, it is just not part of the commercial culture of our country.

One exception is that we have been pretty good at software. I suspect it is because that is a young persons' industry. Once you are over thirty years of age, you are not doing much in the software industry. It is a new culture. The old culture just does not affect it at all. The young people just coming out of school do not care if we are a commodity country. Of course, and there is no economy of scale in software. There is no great advantage to having 1,000 people doing software development. You will do just as well with three people, and even then it is not so easy to collaborate. So Canadians are actually doing better than expected in software development. It is a niche that we are starting to fill quite nicely.

To return to the area of public/private partnership, there is considerable potential in these. Of course, government procurement pro-
grams can stimulate innovation, intelligence, but that is getting harder
to do, based on various trade agreements. Also, as governments have
less money to spend, the matter becomes academic.

One of the interesting things about public/private partnership, or
the privatization of public services, is that many of these services are
tradable services. For example, there is a tremendous need in the world
for water and sewage services that our firm is providing. There is a real
need for environmental services of all kinds; health services, education,
transportation, and so on, all around the world. We advanced countries
can sell these services, but not if they are being done only by the public
sector. The public sector is not very good at selling these things. Once
privatized, it is easier to innovate.

To illustrate again from our experience from the public/private
agreements we have made in the water business, people come to us
with new technology and new ideas. When they went to the municipality
with such new technology and new ideas, the main concern was to
avoid risk and embarrassment in case it did not work. In the public
sector, there may not be money for long-term investment in the budget
for the current year. When they come to us with a new idea, our ques-
tion is whether we can make any money with it. What is the payback?
If we put an investment in now, when do we get a payback? If you
really want us to buy this technology, maybe you ought to give us some
shares in your company since: (a) we are allowing you to demonstrate
it; and (b) we can use your products everywhere we go.

Similarly, we can better deal with the various kinds of suppliers
since we do not have to go to tender every time we need a service. We
can make deals with the service providers which are creative and inno-
vative, and go beyond this one situation.

The private sector is really much better able to innovate, to accept
and to promote innovation. Where the public sector is providing ser-
Vices, I think they should turn those over to the private sector wherever
possible. The role of the public sector should be policy and control, but
the actual operations should be privatized wherever it can be done
without sacrificing the protection of the public. There are many, many
areas where that can happen.

In summary, in Canada the cultural context for innovation is
of crucial importance. We have a lot of changing to do. We will do it,
but it will take longer than many of us would like. And while I have
suggested some possible directions, I do not think we can expect the
government to do a whole lot about it. Change will depend on a great
many actions by individuals and companies, and will take longer than
we might like.