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Senator Stewart (Antigonish-Guysborough): Perhaps we can put that into your hands.

You say that it is possible that the Swedish model is not the ideal one for Canada. Let us go over the model in a more pedestrian way. If we were producing a Canadian-Swedish performance, our industries would be doing a great deal more research and development themselves and on their own sites. They would be financing that themselves and choosing the projects: is that correct?

Dr. Wynne-Edwards: That is correct.

Senator Stewart (Antigonish-Guysborough): At the bottom of the diagram there would be a vastly increased amount of research work being done in the higher education sector, and the increase would be financed almost entirely from government sources.

Dr. Wynne-Edwards: That also is correct.

Senator Stewart (Antigonish-Guysborough): As I read your diagram, there would be some slight increase from private origins, but it would be relatively small. The amount of research then being done by government departments and laboratories would shrink considerably: is that correct?

Dr. Wynne-Edwards: Correct.

Senator Stewart (Antigonish-Guysborough): So, putting it all together, what it seems to say is that on the one hand we should increase greatly the amount of basic or academic research at the taxpayers' expense, and that we should increase greatly the amount of applied research—if I may use that term—money-making research; and that would be done and paid for by people hoping to make money.

Dr. Wynne-Edwards: Correct.

Senator Stewart (Antigonish-Guysborough): Why have we put so much relative emphasis upon governmental institutional research in Canada, and what kind of research would you think should be continued in that sector?

Dr. Wynne-Edwards: Again I am speaking as a citizen, as a private individual. The reason why we have so much research in government is historical, particularly since the Second World War. The Second World War did many things, but one of the things it did was to embed in people's minds that technology was power, was important, was knowledge; and, of course, it led, in this country, to a huge expansion of secondary and post-secondary education after the war and enormous investment in bricks and mortar for universities.

Because there was no industry infrastructure doing much research—in those days the bulk of industry was very close to natural resources and producing raw materials—government institutions and government departments, in paternal fashion, took on the function; so that research was performed, first on behalf of the government and the taxpayer, and, secondly, on behalf of industry by government institutions, because there

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was not enough depth or strength in Canadian industry to do it itself.

That was the perception at the time, and it has led to very large investments in science, in the National Research Council, in agriculture and forestry, fisheries, mining, and so on. We know all that.

You could argue—and I will argue, because I am here as a private individual—that the net effect of that over 50 years—some of it was pre-war—has been to impede the development of viable self-standing, large industries in those sectors in Canada, because as the expertise rests inside government and is not directly linked to making wealth, but simply to being helpful, there is really no incentive for the private sector undertake those tasks itself at its own expense and to use them as competitive tools.

I suppose, if the world goes on the way it is, that the growing of wheat will ultimately depend—in the developed world, where labour costs are very expensive—on combines that start turning in Texas in January and drive north until they hit something north of Lethbridge at the end of October. I don't know—but it will have to be done on a large scale in order to make any money for anybody, given the structure of the world economy and the globalization of competition.

We just do not have the grasp of the problem on that scale in the private sector. The same is true of fisheries. The large factory fishing ships are all Japanese, Russian, and what have you; they are not Canadian. I think you can trace a lot of that back to very long-standing government policies, by governments of various persuasions, which were dedicated largely to helping the small fisherman row his dory just below the horizon—and, incidentally, voting for the party in power. That has been with us for a long time.

That is a long answer to your question. Perhaps that has not mattered until the 1980s. But now the chips are down, and we find ourselves at a colossal disadvantage, even in deploying our own natural resources competitively and profitably in an extremely competitive world.

Senator Stewart (Antigonish-Guysborough): In your response, you make much of the importance of the extractive industries in the historic Canadian economy. Do you see that foreign ownership had much to do with producing a situation in which there is a relatively low level of research and development in Canada by the industrial companies?

Dr. Wynne-Edwards: I do not think it has very much in the primary resource industries. It has had a tremendous impact on manufacturing—in the secondary and tertiary industry. Dealing with the first—the primary sector—the mining industry would view its exploration budget as something akin to research and development. It is money at risk looking for something new. Canadian companies have been competitive and successful in their exploration strategies, by and large.