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Address to the Spectroscopy Society of Canada
on 27 October, 1970

by

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It is most unfortunate that this idea of how advances in science and technology are made seems to escape the science planners in this country and in most other countries. The science planners seem to believe that if everything is properly planned we shall get the best results. They may in this way achieve a very orderly progress, but it will be a very slow one. The unplanned development of science in laboratories that are not fettered by clear-cut directives is far more likely to yield discoveries that may later turn out to be of great practical value.

Most of you I believe will agree with me that it is a very difficult thing to achieve for scientists working conditions that are most apt to stimulate their creative work. Scientists, to do their best work, need freedom, that is, freedom from bureaucratic control, freedom to follow hunches, and freedom to change their research projects. Of course, even if they have this freedom they may not always produce great discoveries. Nobody should expect 100% yield of discovery from a laboratory. I have been told that "it is all right for you to work on whatever you please but most of the younger scientists need direction". The trouble is that it is very difficult to recognize a creative scientist in the early stages of his career. It is

difficult to foresee whether a given scientist during his life will make an important contribution. Some people develop only slowly. The point I am trying to make is that we have to give a chance for discovery to many young scientists if we want to be sure that there will be a few who make great contributions.

In the recently-published OECD report on National Science Policy in Canada it is acknowledged that the National Research Council has done extraordinarily well in making contributions of the first order to basic science, but this statement is coupled with the recommendation that, since the universities are now well-equipped to do basic science (largely at the insistence of far-sighted Presidents of the National Research Council), work on basic science in the National Research Council should be terminated. The OECD examiners completely overlook the difficulty of establishing a laboratory that can make lasting contributions to science of a high order. Once the atmosphere and the spirit has been established in a laboratory one should surely try everything to maintain it, no

matter whether it is in government, industry, or the universities. If creative work which is not in accord with the plans of the science planners is being done in a laboratory we should not take that as a sufficient reason to dismember the laboratory. Scientific discoveries cannot be planned.

The British Council for Scientific Policy in its first report in 1966 recognized this situation by giving the following definition of science policy:

"Science policy does not direct the advance of scientific knowledge, though it may well be concerned to encourage or to direct the application of the results of scientific advances. The tasks of science policy are of another kind: to maintain the environment necessary for scientific discovery; to ensure the provision of a sufficient share of the total national resources; to ensure that there is balance between fields and that others are not avoidably neglected; to provide opportunities for inter-fertilization between fields, and between the scientific programmes of nations."

There will be few practicing scientists who will disagree with this definition. Unfortunately it has not been adopted by science politicians outside Great Britain.

Our science planners talk a great deal about national goals but one cannot help getting the impression that their idea of the future of our country is connected with its physical welfare and not with its cultural welfare. At this point I cannot refrain from quoting to you a brief excerpt from a hearing before the Joint Committee on Atomic Energy of the U.S. Congress. It was an exchange between Senator Pastore from Rhode Island and Dr. Robert Wilson, the director of the National Accelerator Laboratory in Batavia, Illinois, who is in charge of the construction of the largest accelerator ever built (and is incidentally a whole year ahead of schedule in this project). The exchange runs as follows:

Sen. Pastore. Is the accelerator connected in any way with the security of our country?

Dr. Wilson. No, sir, I do not believe so.

Sen. Pastore. It has no value in this respect?

Dr. Wilson. It only has to do with the respect with which we regard one another, the dignity of men, our love of culture. It has to do with those things. It has nothing to do with the military, I am sorry.

Sen. Pastore. Don't be sorry for it.

Dr. Wilson. I am not, but I cannot in honesty say it has such applications but it has to do with whether we are good painters, good sculptors, great poets,

I mean all the things that we really venerate and are patriotic about in our country. In that sense, this new knowledge has everything to do with honor and country but it has nothing to do directly with defending our country except to help make it worth defending.

I am making all these remarks because of a deep concern for the development of science in Canada in the near future. It appears that the science planners in our Senate and in our government have made themselves heard far more than the scientists themselves. It is significant that in the hearing of the Senate Committee on Science Policy very few distinguished scientists were heard except in their official administrative capacity. As a result of the recommendations of this Committee and of the Science Council to the government, we are in danger of losing our chance of continuing the fine tradition of scientific excellence that has been established in Canada during the last fifty years.

I hope you will excuse me for speaking in such sombre tones.

May I say again how much I appreciate the honour you have done me.

27 October, 1970