INTERVIEW WITH DR. HERZBERG

QUESTION: Dr. Herzberg, if you would please, the importance of having Dr. MacKenzie and Canada being fortunate to have a man like him from the start.

HERTZBERG: I believe that Canada was extremely fortunate in having a man like C.J. MacKenzie at the right time uh because MacKenzie having been trained as an engineer understood uh the basis of science - he understood how important basic science is for the advance of applied science and uh more important than that perhaps, he understood how to deal with people, in particular, how to deal with scientists and uh he knew uh the kind of conditions that scientists require to do their best work. He knew that you must not give scientists close directions because the scientist in thinking about a problem uh has his own ideas and you must not try to direct it and he knew that and in the uh development of the National Research Council of Atomic Energy of Canada he followed these intuitive ideas of his about how science develops and how scientists work and I think we were very, very fortunate in having him. Without him I really doubt that Canada would stand where it is today in the development of atomic energy.

1:19

QUESTION: That was better said than the first time. (laughter) So there I was talking about Chadwick's neutron and uh Rutherford at the turn of the century and everything else. Uh it's an example of doing basic research without any grand notions in mind apart from finding out the unknown. Uh and from that it grew into something which today is so important to us all and something which is indeed is a an example of application from something which (background noise) had no application to begin with. Of course, I uh you've been heard many times on the uh this sort of subject and perhaps you could comment on the way that basic research and applied research (background noise) tied in so well together in the entire nuclear program.

HERZBERG: Well, I think that uh the basic thing really was that
the people who developed uh nuclear physics had no
13 idea that it would develop into something useful.
Rutherford, within a year of his death in 1937, said
that anyone who talks about using uh nuclear energy
for practical purposes is talking moonshine and that is
what he thought uh until the end of his life and yet
within a few years after that uh we knew that atomic
energy would be uh uh would be developed on the basis
of the discovery of nuclear fission, but the point is
simply that he just a as little as anybody else could
37 predict what the future of science would bring. He
couldn't foresee that uh uh nuclear fission would
be discovered in 1939 and uh that has changed the whole
outlook in uh in uh atomic energy and again when
uh Hahn and Strassmann discovered nuclear fission, they
were trying to understand what happens if you uh
bombard uh uh nuclei by neutrons. They uh nothing
was further from their minds than the uh uh develop-
ment of atomic energy and uh I think it is one of the
great mistakes uh in our present uh science policy
discussions to assume that you can direct science towards
certain goals.

QUESTION: Was there a problem with anything there? (background noise) (pause) I think we I think really we're done John. We've covered the points we wanted to make. Is there anything we've you feel we've left out in that area of basic versus applied research that should be said and if so here's our chance but uh I think that section will go into the middle and the other section at the beginning. Uh if there's anything else, give you a moment of thought.

HERZBERG: Uh I think uh by uh emphasizing the importance of basic science, of course, I'm not forgetting that uh uh the taxpayer has to pay for it and uh uh the way in which you can uh make it palatable to the taxpayer to pay the basic sciencist is that uh something practical eventually comes out but you cannot ~~perceive~~ foresee these practical applications. There's uh a nice example that I was recently that I recently read uh about J. J. Thompson who was uh uh the uh person under whom Rutherford took his Ph.D. and J.J. Thompson also was the discoverer of the electron and his son, G.P. Thompson, reports in uh a publication that his father, J.J. Thompson, had expressed it this way: The the cave dwellers, if they had a science policy program to improve uh uh their their energy program uh they would have ended up with better and better stone uh axes and things of that sort but they would never have uh developed uh ordinary uh machines as as we know them. They wouldn't have developed metal, how to handle metal because that came not as a a as a plan to develop metals because nobody knew that there were such things. So basic science has to be supported even if you are mainly interested in applied science.

QUESTION: Well spoken. I couldn't agree with you more. Uh you also mentioned over lunch that uh Dr. MacKenzie was most instrumental in having you come to the Research Council when you did uh and you mentioned that you did partly because of the man involved. Could you repeat a bit of that please? I think it's our final point.

HERZBERG: Uh I spent uh tne years at the University of Saskatchewan between 1935 and 45 and then I spent three years at the University of Chicago from 45 to 48. Now, during this time I had correspondence with uh Dr. St~~acey~~eacie and Dr. M~~a~~cKenzie and they uh offered uh me a job at the National Research Council. Now, as a university man, I hesitated naturally uh to take a job in the uh government laboratory but knowing M~~a~~cKenzie and uh knowing and knowing St~~acey~~eacie and knowing the way that they dealt with the situation uh made me uh made it easy for me to uh accept to make such an unusual step as to go from a university laboratory to a government laboratory because I knew and they assured me that at the National Research Council I would have uh uh complete freedom to do what I thought was the best thing to do at that time.

QUESTION: It certainly turned out well, didn't it? (laughter) I think uh I think that was our final point, Dr. Herzberg so uh John if you could relay that. All right, keep talking. What else? (background voice) Okay, please keep your attention on me, we're just wrapping up the end of the tape, I think, and getting a natural finish to it before we go to black, I presume. (pause) (long pause) Now uh he's just uh opening out (etc, etc.)

(Dr. Herzberg is asked to speak on a subject for camera shot purposes)

HERZBERG: How about some remark on (voice over) M~~a~~cKenzie (   ) You see uh atomic energy was developed under the National Research Council. Again, I think uh C.J. M~~a~~cKenzie showed his wisdom when in uh 1952, I think it was, uh he was instrumental in and he recommended to C.D. Howe, who was the minister responsible for NRC, to separate atomic energy from uh the research council, just as a few years earlier he had recommended to uh separate uh Defense Research from NRC. I think those two splits of NRC were very important. For NRC They were important for atomic energy and they were important for Defense Research and I think that in these two cases as in many other cases, C. J. MacKenzie always knew how to do the right thing at the right time. He also retired from atomic energy then ahead of time because he realized that the things that he could do had been done and other younger people should step in. So, in all these ways, I believe that C.J. MacKenzie uh was uh a really great man, great scientific statesman in Canada and uh one other thing that was a great thing he did and that was to discover uh uh Ned St~~acey~~eacie and put him in the position as his successor at NRC. Uh I think uh St~~acey~~eacie uh just like MacKenzie was one of the truly great science politicians , if there is such a word, because both of them understood science perfectly.

QUESTION: (   ) know that much, Dr. Herzberg, about Dr. MacKenzie's relationship with C.D. Howe, that is uh the way the two of them seemed to get on rather well and seemed to understand one another very well. If you do, perhaps you could comment, if you don't, no problem.

HERZBERG: Well, I know about the relation between C. D. Howe and C.J. MacKenzie in a way only second hand, for example, from from St~~acey~~eacie, who told me about it but, of course, they knew one another back from uh C.J. Mackenzie's Dalhousie days and uh if I understand correctly uh C.D. Howe had complete faith in C.J. Mackenzie. He knew that uh if C.J. MacKenzie uh put a document for him to sign, he could sign it without asking any questions. He knew that uh C.J. MacKenzie, if there was a question, would bring it to his attention and so uh there was an automatic uh uh relation between them

that made it very easy for them to come to decisions and C. Howe, of course, also an engineer, uh 28 perhaps uh understood C. J. MacKenzie better than uh uh many other people because they had the same kind of background. But, at any rate, both were men of action, they knew that decisions sometimes have to be uh made promptly and they didn't fuss around for uh weeks or months about a certain question when they both realized things had to be done and this personal relation uh between C.D. Howe and C.J. MacKenzie, I think was
22 very, very important in the development of atomic energy, in Canada.

QUESTION: We, we can tie up uh when you can. I'm very glad we got that five minutes down, (laughter) very glad indeed, cause if we'd cut off we would have missed that and I think it was well spoken again. Are we done? Fine.